MOTOR AGE

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APRIL 1944

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AR & POST-WAR
RVICE ISSUE

A CHILTON PUBLICATION

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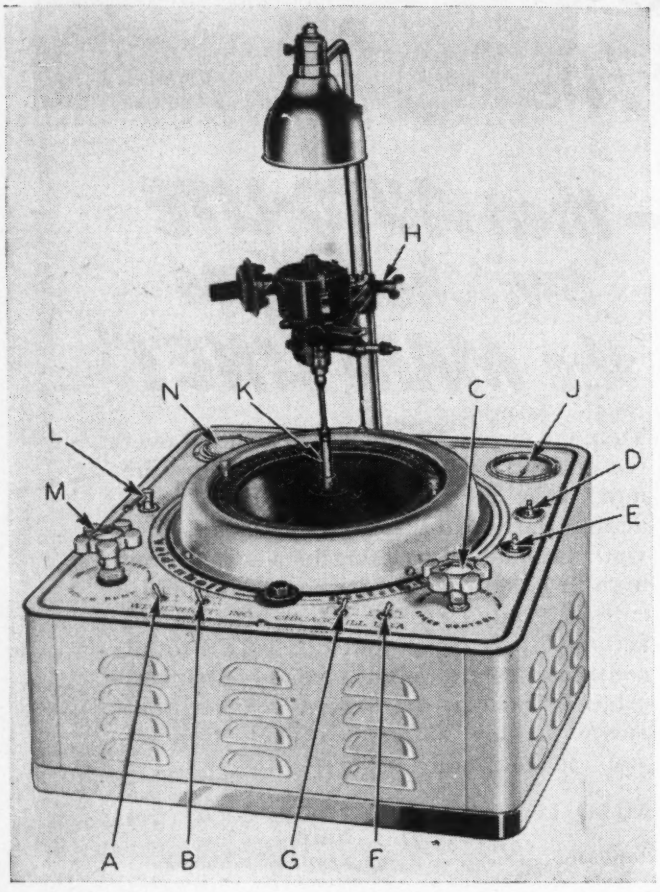

Bench type with double light rotor: A, Line switch; B, Direction of rotation switch; C, Motor speed control; D, Red light terminal; E, Blue light terminal; F, Red light switch; G, Blue light switch; H, Distributor holding vise; J, Tachometer; K, Drive shaft; L, Vacuum pump connection; M, Vacuum pump handle; N, Vacuum gauge.

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MOTOR AGE

With Which Is Combined AUTOMOBILE TRADE JOURNAL

FOR AUTOMOTIVE SERVICEMEN

Vol. LXIII, No. 5 April, 1944

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SLANTS ON THE News

Dealers Get First Chance At Used Army Vehicles

DEALER relations with Treasury Procurement over surplus goods have taken a decided turn for the better. Following the appointment of W. L. Clayton as Surplus War Goods Director, regional offices of Treasury Procurement were instructed to dispose of used motor trucks in a way that protects the interests of dealers.

Only dealers will be permitted to bid on the vehicles now held for disposal, although government agencies will first be circularized and given a chance to buy 1940 and later model trucks.

No bidding on a lot basis will be permitted and the right will be reserved to limit the number awarded to any bidder so that speculative buying may be prevented. Awards will be on the basis of a public drawing.

A dealer is defined as a person who in whole or in part, is in the "business of buying, selling, and repairing or reconditioning used motor vehicles and who maintains a place of business for the display, sale and repairing or reconditioning of such vehicles." Wreckers are definitely excluded.

This arrangement meets most of the demands voiced by dealers when hearings on the Patman Bill were being held. Some dealers would like to see disposal handled under a law written by Congress, but the new move at least clarifies the policy of Treasury Procurement.

Maintenance Manpower Committees Urged by ODT

EXTENSION of the Automotive Maintenance Manpower Committee plan to include country has been suggested by the ODT. This plan, which is now operating in New England, was described in the March MOTOR AGE. It sets up local, state, and regional committees, which investigate all applications for draft deferment and for transfer of skilled men from industry to automotive service shops and makes recommendations to local draft boards on the basis of community needs.

The experience of New England shops with the plan reportedly has been gratifying. Because the standards for deferment and transfer set up by the state committees are stringent, almost every recommendation made by those committees has been accepted by the local boards. The effect has been to relieve to a considerable degree the pressure upon New England shops.

At the moment, the demand of the armed services shows no sign of slacking. Unless some such cooperative effort as the New England plan is adopted generally, repair shops may find themselves in far more critical shape, so far as manpower is concerned, than has been their lot heretofore.

With this special War and Post-War Service issue, MOTOR AGE presents an entire section devoted to service data and tune-up specifications on all current passenger cars.

This information is designed to help you do a faster and more dependable job of keeping war-vital cars on the road. You'll want to keep it for handy reference.

The section starts on Page 27.

Forecast of Cars in 6 Months Denied by NADA

CONSIDERABLE discussion was aroused last month by the reported statement of Ray Chamberlain, executive vice president of the NADA, that new-car production would be resumed within six months. Chamberlain is in position to speak with authority on automotive matters and it was only logical to assume that he had sound, though undisclosed, information on which to base his prediction. Dealers and public alike were cheered by the prospect of obtaining new cars. The only trouble with the statement was that Chamberlain did not make it.

In his talk with a newspaper reporter, Chamberlain said, according to the NADA, that "We believe that WPB will find it necessary to begin to give consideration to the question of new passenger-car production within approximately the next six months. This process will not make it possible to produce new passenger cars before July, 1945."

By omitting the second sentence, it would be possible to twist the first into a statement that new cars could be looked for within six months, although that, clearly, was not the meaning.

Some day, if the war goes on long enough, the number of passenger cars will drop below the 20,000,000 considered indispensable to the war effort and, when that time comes, some provision will no doubt be made to replace a sufficient number. That day has not yet arrived and there is no use trying to hasten it by words. New cars will be made during wartime only when the war effort is endangered by the lack of them.

On the other hand, it is just as unrealistic to set arbitrary dates as to when new cars will be produced. Nothing in the present military picture foreshadows an early end to hostilities but, when the end does come, it will come suddenly and with little or no preliminary rumor. The economic system of the country demands that new-car production follow that happy event as closely as possible.

Factory Men and WPB Discuss Post-War Plans

RESUMPTION of new-car production will be the theme of a meeting April 15 at Washington between officials of passenger-car factories and the WPB. However, the WPB, in announcing the formation of an Automobile Industry Advisory Committee, makes it clear that no new cars will be built until the European war is won.

The purpose of the meeting, WPB Chairman Nelson explained, is to study the basic problems of reconversion to peacetime production, so that the change-over from war production can be made with a minimum loss of time when the need for war goods falls off.

Some other industries have already met with the WPB to discuss the problem as it is related to their fields.

Old-Timers' Resignations At Ford Stir Speculation

RESIGNATION of Charles E. Sorenson as vice president of the Ford Motor Co. drew attention last month to the fact that the resignation of top men has been a frequent occurrence since Edsel Ford died last year.

Sorenson's action severed a connection of 38 years, most of which were spent in developing and directing Ford mass production. His length of service was the longest of any of the men involved in recent changes, but some of those stepping out had served the organization for many years.

A. M. Wibel, who resigned as vice president in charge of purchases last year, had been with the company for 31 years. H. C. Doss, former general sales manager, who resigned recently as regional sales manager for the Southeastern states, had been with Ford 28 years.

Reasons advanced for the resignations were various and none of them gave any hint that shifting company policy was involved. Whatever the post-war plans of the company, it is clear that they will not be laid by the men who helped guide the company through its days of dominance in the passenger-car field.

Lend-Lease Cuts Demands But Truck Building Lags

AS the first quarter of the year draws to a close, the 128,000 trucks for non-military purposes which are to be built this year are still the subject of optimistic conversation. Lend-lease has released 5,000 "paper" trucks, which go into the civilian allotment making a total of 88,000 paper trucks for civilian operators. All this in a year of paper shortage.

Turning from paper trucks to metal ones, which are the only kind that will haul loads, the people who know a great deal about metal trucks and very little about paper ones seem to think that it will be a pretty stiff struggle to produce anywhere near 88,000 trucks. It has been suggested that the goal will still be far away at the end of 1944 unless there are some severe cut-backs in military production.

Production of Tires Falls Halfway Short of Goal

THE 5th Progress Report of the Rubber Director, released March 17, confirms the fact that Report No. 4 was not kidding when it predicted that the first six months of this year would bring a tire crisis. Rubber Director Dewey in the latest report asserts that the production of passenger-car tires during the first half will not exceed 7,000,000. During the second half year, the maximum is set at 15,000,000, or a total of 22,000,000 for this year. This is 8,000,000 fewer tires than the production forecast last year. Even the 22,000,000 cannot be achieved, says the report, without some curb on the wholesale induction of skilled tire builders.

Production of synthetic rubber is virtually on schedule. During the fourth quarter of this year, Buna S will be produced at the rate of 900,000 tons a year and all synthetic rubber at the rate of 1,027,000 long tons. These rates compare favorably with the goals established by the Baruch Committee in 1942.

The report is notable for the kinder words it has for Buna S, the synthetic used for tires. Extensive tests have shown, the report indicates, that passenger-car tires of synthetic are virtually equal to those made of natural rubber, and that medium-size truck

tires containing 70 per cent Buna S and cotton cord, are satisfactory for short hauls. On larger trucks and buses, where overheating is great, tests show that rayon cord instead of cotton cord is imperative. When rayon cord is used in tires containing varying percentages of Buna S, depending on size, results comparable to that of natural-rubber tires can be expected.

NADA Protest Prevents OPA Squeeze on Discount

BY its vigorous protest, the National Association of Automobile Dealers has checked at least temporarily a tendency on the part of the OPA to squeeze the retailer on price increases. The practice of permitting manufacturers to adjust prices to offset mounting material and labor costs and at the same time forbidding the retailer to mark up the increase would, if continued, spell the eventual doom of retailers.

The case over which the NADA made its protest was that in which Chevrolet was permitted by the OPA to increase the wholesale price of three models of its trucks by $135 to $175. In granting the increase, the OPA ruled that dealers could boost the retail price only to the extent of the increase in wholesale prices. The effect of this ruling, of course, was to cut the dealer's discount. After the protest, the OPA amended the order to permit dealers to mark up the increase to the same extent as they had marked up the original price.

In trying to prevent dealers from maintaining their discount, the OPA was not embarking on a new policy. It had done the same thing in connection with other commodities and even with service. However, the attitude poses a threat to the very existence of retail trade, for mark-up in the automobile business is of vital importance. Dealers struggled long and hard for the mark-ups they enjoyed before the war. They will follow with lively interest any development that threatens any narrowing of discount.

Gas Stations May Sell Non-Automotive Lines

ALTHOUGH more than 100,000 of the country's estimated 440,000 filling stations have closed since war began, the stations remaining open are being eyed by the manufacturers of a great variety of goods as possible retail outlets after the war. This is one of the facts revealed by a survey completed recently by the Gasoline Pump Manufacturers Association.

Gas stations before the war sold a good many items not closely related to automobiles and some of the larger stations often had the appearance of small department stores. Perhaps the trend would have continued through the war if restrictions on civilian goods had not been necessary. At any rate, the development seems likely to resume at a faster tempo after the war. These thousands of ready-made outlets look particularly attractive to manufacturers that expect to market new products in the post-war area. Whether their high hopes will be realized depends upon the attitude of automotive buyers. There is no doubt that car owners will be willing to buy a great many convenience goods and certain specialties in this way.

It was also brought out by the survey that gas stations after the war will be fewer and larger and that two to three years will be necessary to replace the stations closed during the war.

Third of East's Oil Supply Now Carried by Pipelines

OIL began to flow from the Little Big Inch pipeline March 4, the Petroleum Administration for War has announced. The line is expected to have a maximum capacity of 180,000 barrels of fuel oil daily or 225,000 barrels of gasoline. Until all 29 pumping stations are in operation, it is unlikely that deliveries will exceed 150,000 barrels of fuel oil daily.

Combined with the more than 300,000 barrels daily being delivered by the Big Inch line, the products carried to the East Coast by the 20-inch line will give the shortage area a daily supply almost equal to one-half its pre-war needs. Other means of transportation more than make up the deficiency, giving the East a total wartime supply of over 1,700,000 gal.

The pipelines may be a source of controversy after the war, but just now they represent a magnificent answer to the challenge thrown down by Nazi U-boats.

With military demands growing hourly, there is no likelihood that any more gasoline will be available for civilians. On the contrary, last month's reduction in allotments for Middle West and Pacific Coast A drivers indicated quite clearly that civilians can expect less gasoline as the impending invasion of Europe nears.

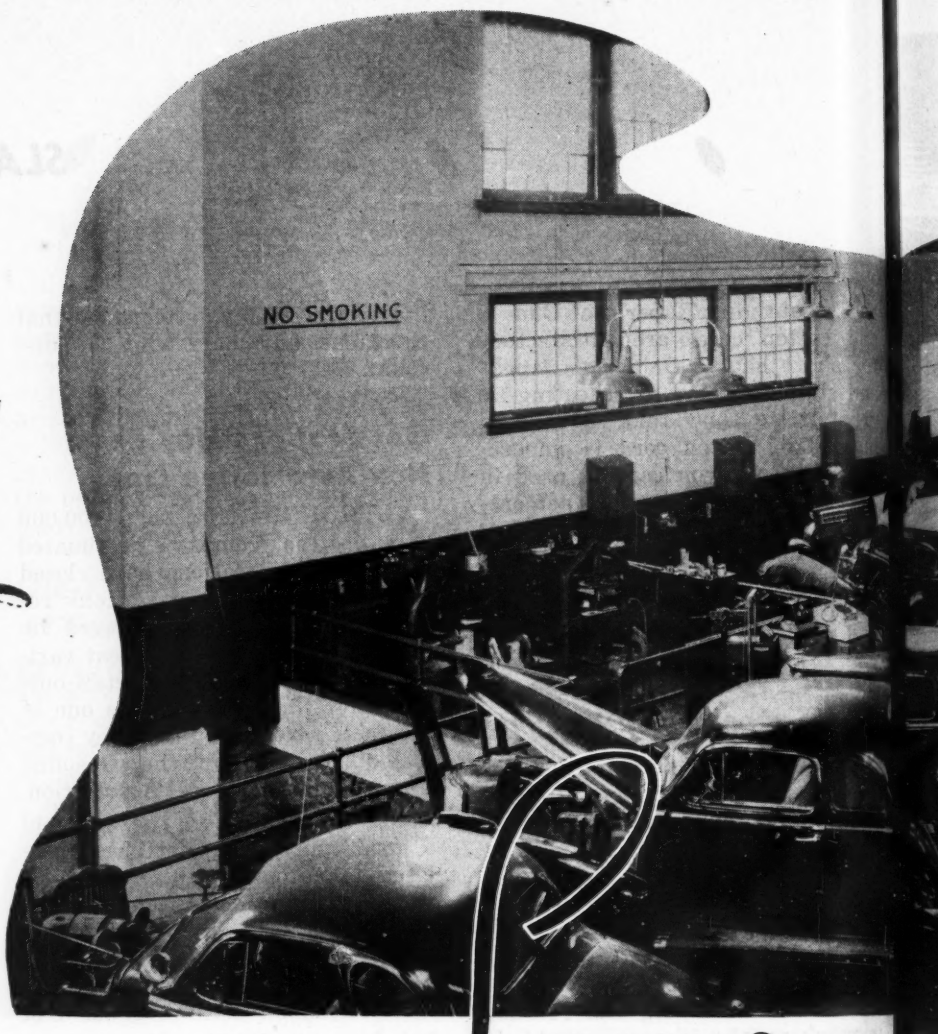
The silver lining is the fact that the invasion, when carried off successfully, will be the beginning of the end, both of war and rationing.

OPA Finds Stored Cars Are Being "Cannibalized"

SOME members of the WPB seem to be willing to admit that a substantial number of new cars in storage have been "cannibalized" to the point where they cannot be made to run without some time and effort being spent on them. Where the missing parts are of a functional nature, they can be replaced but, since non-functional parts have not been made for some time, it will be difficult to find replacements of this kind and it is doubtful that any car buyer will accept a car at premium prices with such parts missing.

There has been some talk that OPA would like to do some policing of the price schedule of replace-

(*Continued on page* 91)

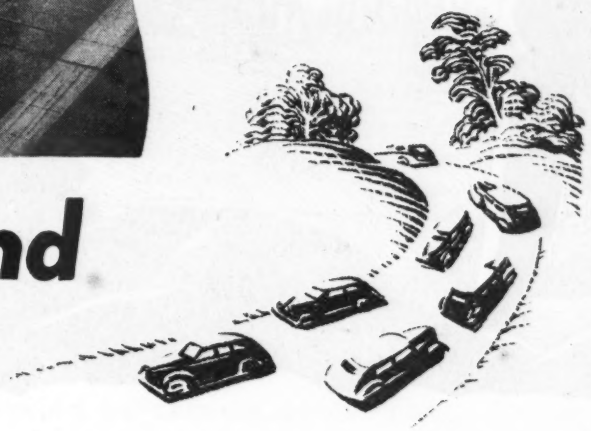


Peace to Spur Service

When driving restrictions are lifted, the desire of owners to keep present cars in condition until new ones are available will create record market

By BILL TOBOLDT

EVER since the war started and new-car production stopped, independent and car-dealer shops have been flooded with work and most automotive observers agree that post-war service volume should accelerate from the present high levels to still higher ones when the post-war period is reached. The only immediate problems of such shops have been the difficulties in getting parts and lack of trained mechanics. With the cessation of hostilities, these two problems will no longer exist, but total maintenance business should continue at an even higher volume.



Demand

It is not only interesting but important at this time to get an idea of the size of this maintenance market in order to plan as intelligently as possible for the future. The wholesale value of replacement parts production for civilian use in 1941 was $718,212,295. In general, this is conceded as being an abnormal year, as a large portion of the parts produced went into inventory. In 1933, admittedly a poor year, parts production exceeded $234 million. In 1938, the volume was $348 million, while in 1942, with civilian parts curtailed by government decree, the volume was $472 million. These figures may serve as a gage when estimating future business. However, when considering future volume of maintenance business, several additional and important factors must be remembered. First of all, approximately 75 per cent of the cars are limited to an "A" ration book which is equivalent to about 1500 miles per year. It is only the remaining cars, with their B and C ration books, some five or six million vehicles, which may be considered as approaching peacetime mileage and it is this group, plus an occasional "A" car, that is clamoring for service at the door of the repair shops.

The reason that service volume is so high in spite of reduced car mileage is that many of the cars have reached and passed the age at which they would normally be junked. Before the war such cars totaled over 2 millions a year. However, in 1943 only half of that number was scrapped, so that total cars registered in that year were 25,451,007. In normal times, over 50 per cent of the cars were less than five years old and about 18 per cent were two years old. Today, however, the latest model, having left the factory in 1942, is two years old. Formerly, the average life of a car was considered as being 7½ years and a car was junked because it was no longer economical to repair it. But today the owners of such cars will continue to drive them and they will not replace their cars with newer models until new car production is resumed. In other words, as a result of war conditions, all cars will be driven as long as mechanical ingenuity and the necessary parts can keep them rolling. Obviously, as the age of the cars increase, their service requirements become greater.

Another factor contributing materially to present-day service volume is the character of the driving. The short trips resulting from fuel rationing have accelerated cylinder and ring wear. Fuel of lower octane value causes detonation which in turn means burned valves and spark plugs. Such conditions resulting in shortened life of parts naturally contribute still further to the present congestion in the service stations.

With the lifting of rationing restrictions, service business should immediately accelerate beyond the present high levels because of the increased mileage which will be permitted and also because many car owners have postponed having their cars repaired for patriotic reasons.

The resumption of new-car production should not adversely affect this post-war service volume because not only will it take many months to get into full production but the demand for new cars will far exceed the supply. An estimate of this demand can be made by

(*Continued on page* 93)

Dealers Look Forward to Post-War

UNLESS all present signs are deceptive, automobile dealers will find the immediate post-war era a period of unprecedented prosperity. Only the most unexpected turn in domestic or world affairs can prevent the highest level of production in automotive history and a demand for new cars that promises to be overwhelming. The few obstacles now discernible can be readily surmounted by intelligent planning and action.

The soundest basis for any estimate of post-war car sales is the actual need for new cars. This need, by the time the war ends, will be so huge as to stagger the imagination. One serious study of post-war markets has shown that car factories must produce at top speed for more than four years merely to replace the vehicles that have gone out of service since war began. This study does not take into account the vast expansion of purchasing power or the demand arising from

Public's hunger for new cars and its record-breaking purchasing power can keep sales at high level for years if sane plans are laid now for after war

Prosperity

By J. EDWARD FORD

the normal increase in population.

The estimate is a matter of simple arithmetic. In 1941, the year war began for the United States, owners in the country registered 28,842,622 passenger cars. Last year, registrations fell to 25,450,000, a drop of more than 3,350,000. By July 1 next year, which is the earliest date at which most observers feel the war can end, the number of cars registered may drop to 21,000,000, or nearly 8,000,000 less than when war began.

The greatest production for domestic use in a pre-war year amounted to around 4,000,000 passenger cars. During peacetime, an average of 2,000,000 cars a year was scrapped. If this rate is resumed after the war, the net gain will be 2,000,000 cars a year, which will mean that four years will be required to replace the cars taken out of service since 1941. Thus, actual needs should keep both factories and dealers gainfully employed until 1949.

Scrapping of cars has fallen off sharply during the war years. Fewer than 1,000,000 went to the junkyards last year. However, this does not mean that cars are not wearing out as fast as they ever did, but only that 1,000,000 cars, which should have been scrapped, are still being driven. Every junker being kept on the road through wartime necessity will be scrapped as soon as sufficient new cars are available.

Many guesses have been made as to when new-car production will be resumed. Although an increasing quantity of civilian goods will be produced from now on, it is not likely that car factories will be permitted to cease war production until an armistice is signed. Factory executives have estimated the reconversion period at anywhere from three months to six months. In this interval, with more fuel and perhaps more tires to be had, the cars on the road, and especially the older cars, will demand more service than ever before. Dealers will get all the service business they can handle and there will be an abundance for independent shops, even those that reopen and those that enter the field for the first time.

There will be no lack of purchasing power to enable the public to pay for this service and for the new cars for which it has starved since 1941. Restrictions on the production of civilian goods have dammed up a tremendous reservoir of ready cash. The National Association of Manufacturers has estimated that the public on Jan. 1 this year had laid by the vast sum of $58,000,000,000. Cash savings alone amounted to an estimated $26,000,000,000, in addition to a probable $27,000,000,000 in war bonds. The potential purchasing power has been furthered by an estimated $5,000,000,000 in installment credit.

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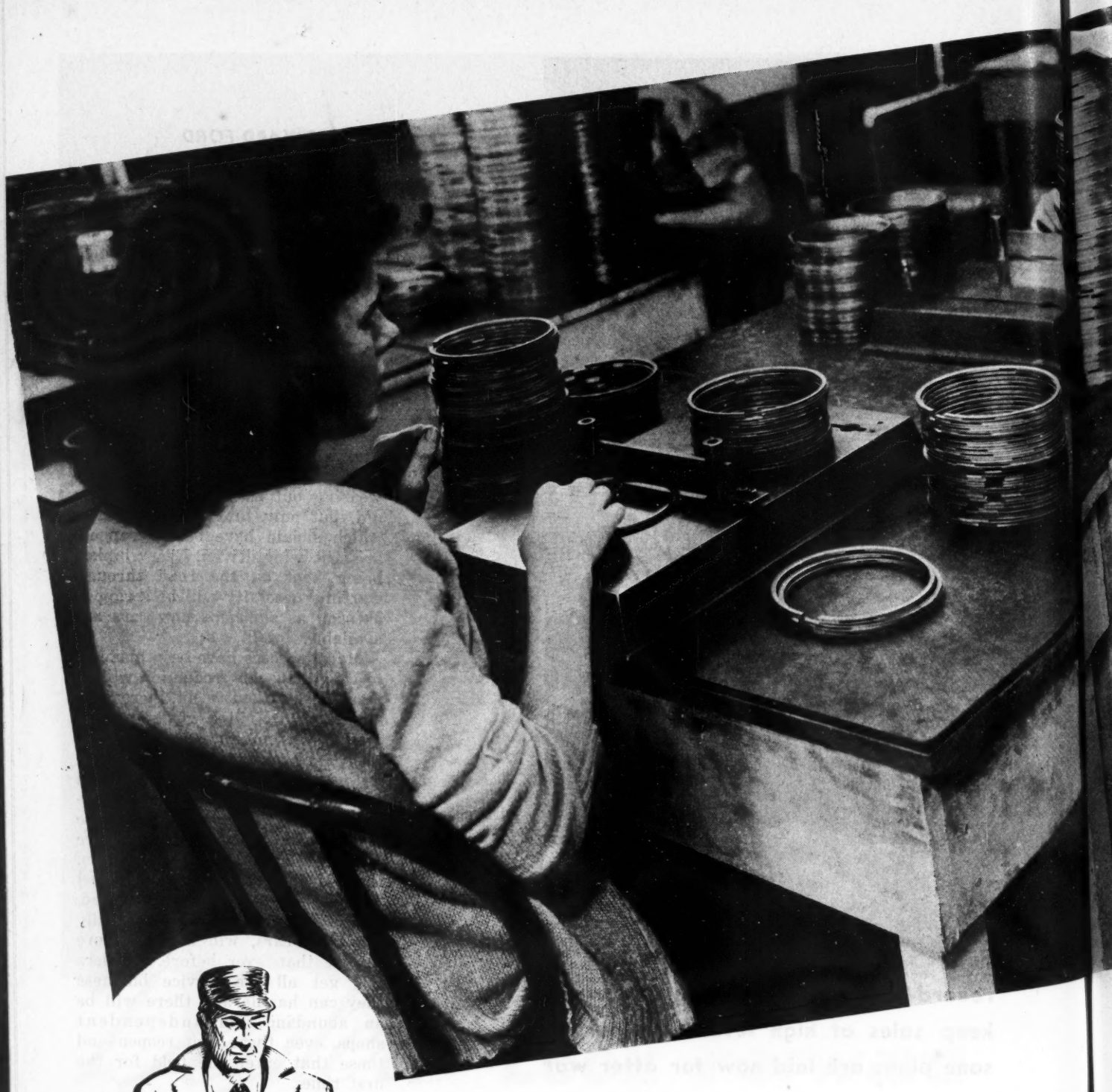


REPLACEMENT parts to keep the nation's essential motor vehicles in operation will be more plentiful this year, according to present WPB plans. This is fortunate, for the demand for repair parts is expected to jump 30 to 40 per cent over 1943. The newest passenger car today was manufactured more than two years ago, although some 30,000 new cars remain to be rationed to essential civilian users. Thirty per cent of the passenger vehicles on the road are more than 7½ years old, according to the estimates of one large manufacturer, while only 13 per cent are less than 2½ years old. This means an increasing demand for parts to keep all these cars in operating condition.

Materials for spare parts are much more plentiful than they were a year ago. Steel, aluminum, copper, lead and zinc supplies have grown appreciably in the last six months. The WPB granted the entire ODT request for 137,000 tons of carbon steel for automotive replacement parts in the second quarter of 1944, a 47 per cent increase over the first quarter allotment of 93,000 tons. Supplies of cadmium, nickel, tungsten and tin remain tight, but material shortages are not nearly so acute as they were a year ago.

Chief limiting factors in replacement parts output today are manpower and facilities. Although labor is somewhat more plentiful, shortages are evident in certain war-production centers and indus-

Do We Have a Parts Crisis?

With the Army paring requirements and more material becoming available, the chief threat to an adequate supply for civilians is the labor shortage

By ED WARNER

tries. Facilities also are heavily involved in war production in the axle, transmission, gear and bearing plants, making it difficult to divert much capacity to the manufacture of civilian replacement parts. The shortage of labor and machines is particularly acute in foundries which turn out forgings and castings. This may improve as war demands are filled but the outlook is uncertain for the remainder of 1944.

Output for replacement parts totaled $525,000,000 in 1943, according to an estimate by the Automobile Manufacturers Association, based on federal excise tax receipts. This was a 10 per cent gain over the 1942 parts production of $471,956,985. WPB estimates for 1944 production range from $750,000,000 to $800,000,000. Should this total be reached, the requests of ODT, as claimant agency for civilian transportation, will have been fully met.

Shortages of grilles, doors, fenders and other passenger body parts are beginning to become apparent as manufacturers' stocks of these items become exhausted. Production of such non-functional parts has been banned since Sept. 12, 1941. There appears to be no immediate disposition to relax these restrictions. Production of front fenders that house headlights is permitted but, even in this case, the manufacturer may not have the facilities available to set up the necessary dies in a press that probably would have to be overhauled to run again after a 2½ or 3-year lapse. A new type of alloy steel also may have to be used and this requires some experimenting.

(*Continued on page* 68)

Laughs OF THE MONTH

"I'm conducting a manufacturers' survey on post-war cars. Tell me, what would you like to see?"

"I've finally discovered a substitute for gasoline!"

"One thing about Hank—he really tells the WPB what he thinks!"

"Just how much experience have you had installing timers?"

War and Post-War

SERVICE DATA

CURRENT PASSENGER CARS

BUICK

SERVICE DATA

HORN BUTTON REMOVAL 1937-42

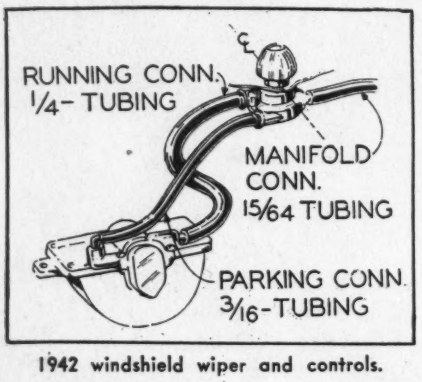
To remove horn button on solid spoke wheel, pry on outer edge of the button with a small screw driver and lift out.

On the flexible spoke wheel, remove the three screws on the underside of hub.

OIL PAN REMOVAL 1936-42

Remove front stabilizer brackets bolted to frame on 1936 and 1937 models only.

Disconnect stabilizer links at the lower control arms and lift off on 1936 and 1937 models only.



1942 windshield wiper and controls.

Remove cap screws around pan and lower to floor.

PISTON AND ROD INSTALLATION 1936-42

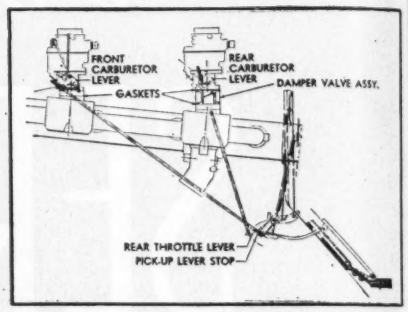
Install pistons with the T slot toward the left side of engine. Install connecting rods so that the marker on the rod and cap points toward the rear of engine.

MAIN BEARINGS REMOVAL 1936-42

Steel-backed, babbitt-lined bearings are locked in crankcase and bearing caps by offset tangs at the parting line. Bearing caps are inset in crankcase to insure uniform clearance and maintain alignment. Main bearings are renewable from below in full sets only. Shims are provided to allow adjustment without filing cap. Not necessary to remove engine.

TRANSMISSION REMOVAL 1936-42

Remove rear-axle assembly. See Rear-Axle Removal. Remove rear transmission support and steady rest rod. Attach shims used at each end of transmission support to ends of support so that same number of shims will be used on each side when reinstalled. After removing bolts holding transmission to housing, insert guide pins in two top holes then slide transmission clear of clutch hub and remove.



1941-42 compound carburetion throttle linkage adjustment.

CLUTCH REMOVAL 1936-42

Remove rear axle and transmission. See Rear Axle Removal, also Transmission Removal.

Remove lower flywheel and clutch housing.

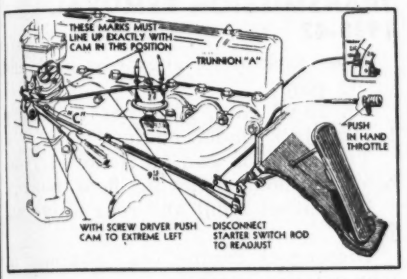
Disconnect clutch linkage at outer end of release yoke.

Remove spring washer in flywheel housing, which retains clutch-release bearing support. Remove support. Clutch-release bearing and release yoke may now be removed from ful-

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance: Intake	VALVES: Operating Tappet Clearance: Exhaust	Rods Removed from	IGNITION: Spark Plug: Make and Model	IGNITION: Spark Plug: Gap	IGNITION: Timing: Spark Occurs—No. Deg.	IGNITION: Timing: Breaker Gap	IGNITION: Timing: Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN: Diameter	CRANK-PIN: Length	FRONT AXLE: Caster (Degrees)	FRONT AXLE: Camber (Degrees)	FRONT AXLE: Toe-in (Inches)	FRONT AXLE: Kingpin Inclination (Degrees)
34-40, 35-40	1934-35	8-3 3/32x3 7/8	.012	3B	.008H	.008H	B	AC-H9	.025	2B	.015	31	7	14	88	2	1 1/4	2 3/4-3 1/4 E	0-3/4	0-1/8	4 1/2(b)
34-50, 35-50	1934-35	8-2 11/16x4 1/4	.008	5 1/16B	.008H	.008H	B	AC-H9	.022	7B	.015	31	7	15	82	2 1/8	1 1/16	1 3/4-2 1/4 E	0-3/4	0-1/8	5 1/2(b)
34-60, 35-60	1934-35	8-3 1/32x4 5/8	.008	5 1/4B	.008H	.008H	B	AC-H9	.022	11B	.015	31	8	18	82	2 1/4	1 1/16	1-1 1/4 E	0-3/4	0-1/8	5 1/2(b)
34-90, 35-90	1934-35	8-3 1/16x5	.008	5 1/4B	.008H	.008H	B	AC-H9	.022	10B	.015	31	9	23	74	2 3/8	1 1/16	1-1 1/4 E	0-3/4	0-1/8	5 1/2(b)
38-40	1936	8-3 3/32x3 7/8	††	3 1/4B	.015H	.015H	A	AC-H9	.025	2B	.015	31	6	13 1/4	118†	2	1 1/4	3-3 1/2	1/4N-3/4P	1/4-1/8	3 1/2-4
60, 80	1936	8-3 1/16x4 1/8	††	6B	.015H	.015H	A	AC-H9	.025	10B	.015	31	8	17	108†	2 1/4	1 1/16	1 3/4-2 1/4	1/4N-3/4P	1/4-1/8	4 1/2-5
36-90	1936	8-3 1/16x4 1/8	††	6B	.015H	.015H	A	AC-H9	.025	10B	.015	31	8	17	108†	2 1/4	1 1/16	3/4-1 1/4	0-1 1/4P	1/4-1/8	4-5
37-40	1937	8-3 3/32x4 1/2	††	5 1/4B	.015H	.015H	A	AC-H9	.024	2B	.015	31	6	13 1/4	120†	2	1 1/16	1/4N-3/4P	1/4N-1P	0-1/8	3 1/2-4 1/2
60, 80, 90	1937	8-3 1/16x4 1/8	††	6B	.015H	.015H	A	AC-H9	.024	10B	.015	31	8	17	119†	2 1/4	1 1/16	1/4N-3/8P	1/4N-1P	0-1/8	
40	1938-39	8-3 1/32x4 1/8	††	5 1/4B	.015H	.015H	A	AC-46	.025	4B	.015	31	6	13 1/4	112	2	1.21	1/8N-±3/8	1/4N-1P	0-1/8	3 1/2-4 1/2
60, 80, 90	1938-39	8-3 1/16x4 1/8	††	6B	.015H	.015H	A	AC-46	.025	6B	.015	31	8	17	114	2 1/4	1.31	1/8N-±3/8	1/4N-1P	0-1/8	F
40, 50	1940	8-3 3/32x4 1/8	††	5 1/16B	.015H	.015H	A	AC-46	.025	4B	.015	31	8	12 1/2	112	2	1 1/16	3/8±3/8	−1/4+1	0-1/8	3 1/2-4 1/2
60, 70	1940	8-3 1/16x4 1/8	††	6B	.015H	.015H	A	AC-46	.025	6B	.015	31	10	16	114	2 1/4	1 1/16	3/8±3/8	−1/4+1	0-1/8	3 1/2-4
80, 90	1940	8-3 1/16x4 1/8	††	6B	.015H	.015H	A	AC-46	.025	8B	.015	31	10	16	114	2 1/4	1 1/16	0±3/8	−1/4+1	0-1/8	4-5
40, 50	1941	8-3 3/32x4 1/2	.....	13B	.015H	.015H	A	AC-104	.027	2B	.015	31	6	13	142	2	1 1/16	3/8±3/8	1/8N-1 1/8P	0-1/8	3 1/2
60, 70	1941	8-3 1/16x4 1/8	.....	14B	.015H	.015H	A	AC-104	.027	6B	.015	31	8	16 3/4	151	2 1/4	1 1/16	3/8±3/8	1/8N-1 1/8P	0-1/8	3 1/2
90	1941	8-3 1/16x4 1/8	.....	14B	.015H	.015H	A	AC-104	.027	6B	.015	31	8	19	151	2 1/4	1 1/16	3/8±3/8	1/8N-1 1/8P	0-1/8	3 1/2
40	1942	8-3 3/32x4 1/2	.....	13B	.015H	.015H	A	AC-46	.025	4B	.015	31	6	13	112	2	1 1/16	3/8±3/8	1/8N-1 1/8P	0-1/8	3 1/2-4 1/2
50	1942	8-3 3/32x4 1/2	.....	13B	.015H	.015H	A	AC-46	.025	6B	.015	31	6	13	115	2	1 1/16	3/8±3/8	1/8N-1 1/8P	0-1/8	3 1/2-4 1/2
60, 70, 90	1942	8-3 1/16x4 1/8	.....	14B	.015H	.015H	A	AC-46	.025	8B	.015	31	6	13	115	2 1/4	1 1/16	3/8±3/8	1/8N-1 1/8P*	0-1/8	3 1/2-4

BUICK

SERVICE DATA


THESE MARKS MUST LINE UP EXACTLY WITH CAM IN THIS POSITION
TRUNNION "A"
PUSH IN HAND THROTTLE
WITH SCREW DRIVER PUSH CAM TO EXTREME LEFT
DISCONNECT STARTER SWITCH ROD TO READJUST

1937 accelerator switch adjustment (all series).

crum as an assembly by pulling outward on the outer end of the yoke.

Mark pressure-plate assembly position in flywheel so that it may be reassembled in same relative position in order to preserve engine balance.

Remove clutch pressure-plate assembly by loosening retaining screws evenly. Use of metal spacers between release levers and clutch cover will relieve spring tension on retaining screws and facilitate clutch handling. On Series 40, 50, spacers cannot be used and are not necessary.

FLYWHEEL REMOVAL 1936-42

On 40 and 50 Series, remove oil pan and rear main-bearing cap to remove flywheel bolts.

On 60, 70, 90 Series, it is not necessary to remove oil pan.

AXLE SHAFT REMOVAL 1936-42

Remove wheel.

Drain oil and remove cover.

Remove differential pin set screw and withdraw pin.

Remove spacer block.

Rotate ring gear and remove pinions.

Push in on axle shaft and remove "C" washer, then withdraw axle shaft. Some models have nuts on the end of axle shaft instead of "C" washers.

PROPELLER SHAFT REMOVAL 1936-42

Remove Rear Axle (see Axle Shaft Removal).

Remove rear axle assembly (see rear axle removal).

Remove third member from housing.

Mark differential bearing caps and differential bearing adjusting nuts for location of adjustment and to indicate right and left hand parts.

Remove the three pinion-adjusting screws and withdraw pinion and propeller-shaft assembly. If necessary, tap exposed end of propeller shaft with hardwood block, tapping toward rear.

PINION BEARING REMOVAL 1936-42

File off one head of the straight pin and drive out the pin.

Pull the pinion shaft from the propeller shaft. Puller should be used.

Pry up staked section of pinion-bearing nut and remove nut.

Press off pinion front bearing, using blocks under outer race.

RING GEAR AND PINION REMOVAL 1936-42

To renew pinion gear, see Pinion Bearing Removal procedure.

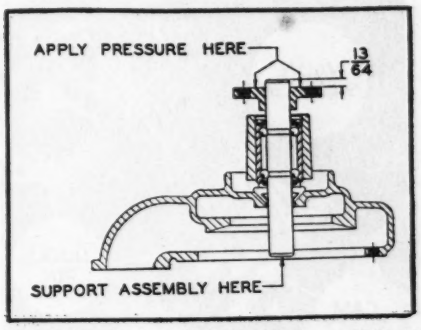
When differential case or ring gear is damaged and is to be replaced, drill out rivet heads from case flange sides, using a ⅜-in. diameter drill. A cold chisel should not be used, as it would distort the differential case.

Back up case or gear flange solidly around rivet head and drive out rivets.

After removing ring gear, inspect case flange rear seat for run-out. If run-out is over .002 in., case should be trued up in lathe.

Bolt gear to case securely, leaving open hole between each two bolts for riveting.

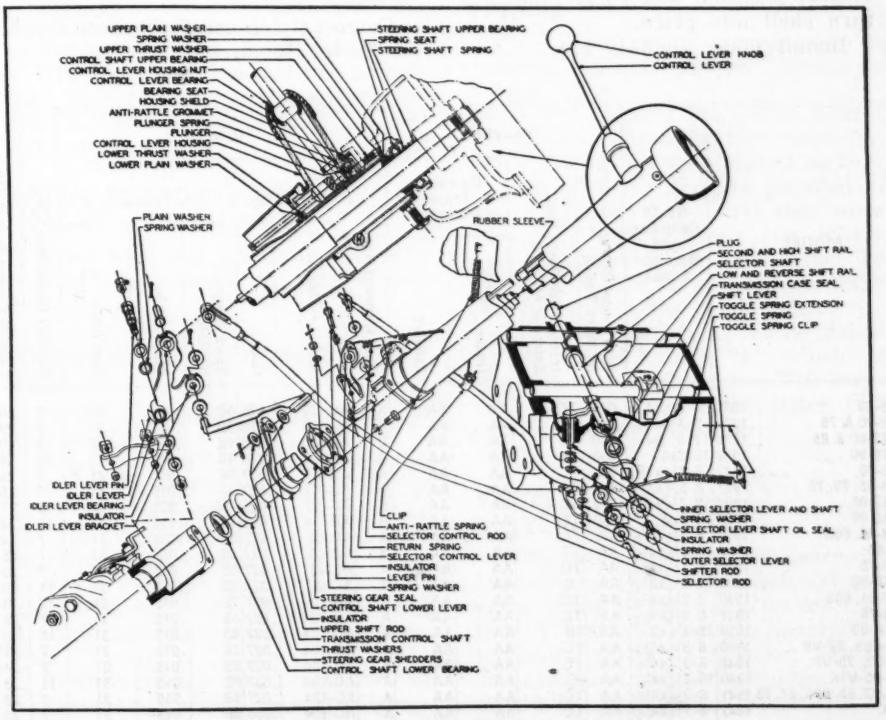
Run-out at back of gear must not exceed .006 in. after gear is riveted.



Dimension for installing fan hub on 1941-42 water pump.

GAS TANK REMOVAL 1939-42

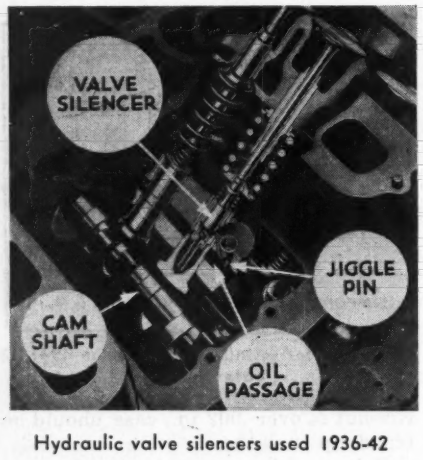
Remove filler cap, disconnect gas line, and the tank straps at rear end. After the tank is sufficiently removed to provide access, disconnect gasoline gage wire and lower tank to floor.



1941-42 steering column shift control details.

CADILLAC

SERVICE DATA



Hydraulic valve silencers used 1936-42

MAIN BEARINGS REMOVAL 1936-42

Remove cap and take out worn lower shell. Rotate crankshaft in reverse direction to turn upper shell out of crankcase, using a flattened cotter pin in the oil-passage hole to contact the bearing shell and force it out.

Place new upper shell on crankshaft journal with locating lug in correct position, and rotate shaft to turn shell into place.

Install lower shell in cap.

PISTON INSTALLATION 1936-42

Install pistons with the T-slot to the left side of engine. Rod and piston assemblies are removed from above.

CONNECTING ROD INSTALLATION 1936-42

Assemble connecting rods to crankshaft with the numbers toward bottom of case and numbers on caps in line with rod numbers. Rod and piston assemblies are removed from above.

CLUTCH REMOVAL 1936-42

Remove transmission (See transmission removal).

Remove clutch housing pan.

Mark flywheel and clutch pressure plate assembly as these are balanced at factory and should be replaced in same position.

Loosen retaining screws that hold clutch on flywheel, a turn or two at a time, until spring pressure is fully released.

Remove retaining screws and take clutch assembly and driven disc from flywheel.

Correct clutch-pedal clearance should be ⅞ to 1⅛ in.

TRANSMISSION REMOVAL 1938-42

Place jack under engine at back end of oil pan.

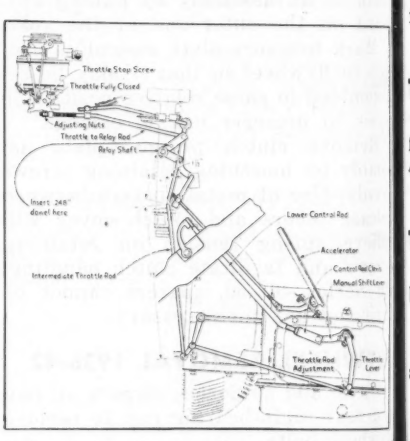
On 40-90 cars, it is not necessary to put jack under engine.

Transmission can be removed from below without removing floor boards.

Disconnect front and rear universal joint.

Disconnect engine rear support at transmission extension.

Remove cross member that carries engine rear support.



Adjustment of manual control lever and throttle control linkage.

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance: Intake	VALVES: Operating Tappet Clearance: Exhaust	Rods Removed from	IGNITION: Spark Plug: Make and Model	IGNITION: Spark Plug: Gap	IGNITION: Timing: Spark Occurs—No. Deg.	IGNITION: Timing: Breaker Gap	IGNITION: Timing: Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN: Diameter	CRANK-PIN: Length	FRONT AXLE: Caster (Degrees)	FRONT AXLE: Camber (Degrees)	FRONT AXLE: Toe-in (Inches)	FRONT AXLE: Kingpin Inclination (Degrees)
V8-60	1936 8-3⅜x4½	.000	TC	AA	AA	A	AC-K9	.026	5B	.015	31	7	30	103	2.46	2⅓	1½-2	¼-1	0-1/16	4° 51'
V8-70 & 75	1936 8-3½x4½	.000	TC	AA	AA	A	AC-K9	.026	5B	.015	31	7	29	103	2.46	2⅓	¾-1¼	0-½	0-1/16	5° 38'
V12-80 & 85	1936 12-3½x4	.000	TC	AA	AA	B	AC-G6	.026	4B	.021	37	9	19	99	2½	2¼	¾-1¼	0-½	0-1/16	5° 38'
V16-90	1936 16-3x4	.000	TC	AA	AA	B	AC-G6	.026	4B	.016	31	10	24	99	2½	2¼	1½	1	1/8-1/16	4
V8-60	1937 8-3½x4½	.000	TC	AA	AA	A	AC-K7	.027	5B	.015	31	7	25	155†	2⅜	1⅔	¼-1	¼-1	1/32-1/32	4° 51'
V8-65, 70, 75	1937 8-3½x4½	.000	TC	AA	AA	A	AC-K7	.027	5B	.015	31	7	25	170†	2⅜	1⅔	0-±¼	0-½	1/32-1/32	5° 38'
V12-85	1937 12-3½x4	.000	TC	AA	AA	B	AC-G7	.025	10B	.021	37	9	17	145†	2½	2¼	0-±¼	0-½	0-1/16	5° 38'
V16-90	1937 16-3x4	.000	TC	AA	AA	B	AC-G6	.025	4B	.016	31	10	24	154†	2½	2¼	0-±¼	0-½	0-1/16	4¼°
V8-60, 60S	1938 8-3½x4½	AA	TC	AA	AA	A	AC-45	.027	5B	.015	31	7	24	155†	2.46	2⅓	¾N-0	¼-1	1/32-1/32	4° 51'
V-65	1938 8-3½x4½	AA	TC	AA	AA	A	AC-45	.027	5B	.015	31	7	25	155†	2.46	2⅓	¼N-¼P	0-½	1/32-1/32	5° 38'
V8-75	1938 8-3½x4½	AA	TC	AA	AA	A	AC-45	.027	5B	.015	31	7	25	170†	2.46	2⅓	¼N-¼P	0-½	1/32-1/32	5° 38'
V16-90	1938 16-3¼x3¼	AA	B	AA	AA	A	AC-45	.027	6B	.015	31	11	30	180†	2	1¾	¼N-¼P	0-½	1/32-1/32	5° 38'
V8-61, 60S	1939 8-3½x4½	AA	TC	AA	AA	A	AC-104	.027	5B	.015	31	7	25	155†	2.46	2⅓	G	GG	1/32-1/32	GH
V8-75	1939 8-3½x4½	AA	TC	AA	AA	A	AC-104	.027	5B	.015	31	7	25	170†	2.46	2⅓	¼N-¼P	0-1/16	1/32-1/32	5° 1'
V16-90	1939 16-3¼x3¼	AA	6B	AA	AA	A	AC-104	.032	6B	.015	31	11	30	180†	2	1¾	¼N-¼P	0-½	1/32-1/32	5° 38'
40-60S, 62-V8	1940 8-3½x4½	AA	TC	AA	AA	A	AC-104	.027	5B	.015	31	7	24½	155†	2.46	2⅓	N1½-N2¾	0-¾	1/32-1/32	5° 8'
40-72, 75-V8	1940 8-3½x4½	AA	TC	AA	AA	A	AC-104	.027	5B	.015	31	7	24½	170†	2.46	2⅓	N½-N1	0-¾	1/32-1/32	5° 8'
40-90-V16	1940 16-3¼x4¼	AA	6B	AA	AA	A	AC-104	.032	6B	.015	31	11	30	180†	2.00	1¾	N½-N1	0-½	1/32-1/32	5° 1'
61, 62, 63, 60S, 67, 75	1941 8-3½x4½	AA	TC	AA	AA	A	AC-104	.027	5B	.015	31	7	25	182	2.46	2⅓	N1¾-2¾	⅛N-⅜P	1/32-1/32	5° 51'
All	1942 8-3½x4½	AA	TC	AA	AA	A	AC-104	.030	5B	.015	31	7	25	100	2.46	2⅓	N1¾-2¾	⅛N-⅜P	1/32-1/32	5° 51'

CADILLAC

SERVICE DATA

Disconnect the speedometer cable.

Remove shifter connecting rods at levers on transmission.

Loosen transmission cap screws holding transmission to bell housing, and, while supporting transmission at rear end so that clutch connection shaft can be kept in, line with clutch hub, slide transmission back being careful not to leave weight of transmission bend clutch hub.

Plug drain hole for clutch connection shaft bearing to prevent loss of lubricant.

Remove transmission, lowering front end first.

TRANSMISSION REMOVAL 1937

V8, V12 Series—after removing floor boards same procedure as 1938-42 Series.

TRANSMISSION REMOVAL 1936

36-60 Series. After removing floor board same procedure as 1941 Series.

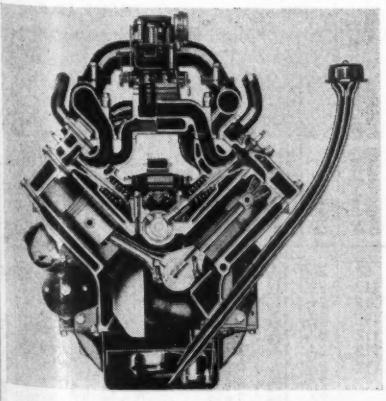
36-70, 75, 80, 85.

Disconnect front universal joint and remove joint from propeller shaft.

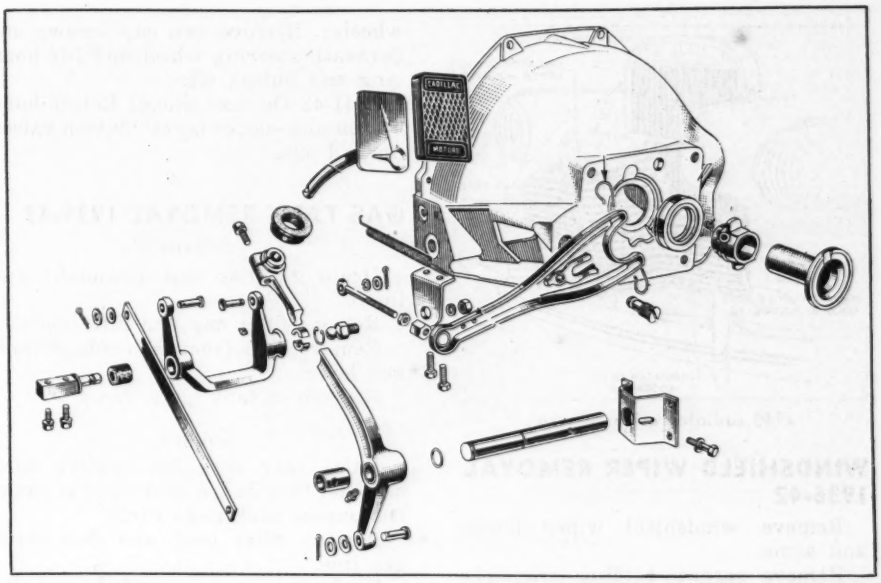
Remove transmission rear support together with the cross member, bolted to the frame, that carries this support.

Disconnect clutch release mechanism.

Unbolt the transmission and remove by pulling it straight back until the clutch connection is all the way out of the clutch hub so as not to bend or damage the clutch driven disk.



1936-42 V-8 engine.



1938-40 clutch throwout mechanism.

AXLE SHAFT REMOVAL 1936-42

Remove road wheel.

Remove axle nut and pull off drum.

Remove dust seal from rim of brake drum.

Pull wheel hub and brake drum assembly off shaft.

Disconnect brake dust shield.

Pull the shaft and bearing assembly. Be careful not to damage grease retainer next to inner side of wheel bearing.

HORN BUTTON REMOVAL 1936-42

Press horn cap down and turn left or right until catch is released, and remove cap.

WINDSHIELD WIPER REMOVAL 1936-42

Remove windshield wiper blades and arms.

Remove screws holding transmission to cowl. Disconnect connecting links at wiper motor allowing links to drop down. Transmission can then be lifted from outside.

It will be necessary to remove glove compartment box when removing transmission on the side of the glove box.

Remove rubber hose connection between main vacuum line and wiper motor.

Remove machine screws which hold wiper motor and mechanism to wiper support.

HYDRAULIC VALVE LIFTERS 1936-42

On V8 engines it is necessary to remove lifters before removing valves.

On V16 engines the valves should be removed first. When removing lifter assemblies, they should be kept in their proper order and installed in the same lifter holes that they were removed. Two different size lifters are used—the larger size must be installed in the large holes and the smaller size in the small holes.

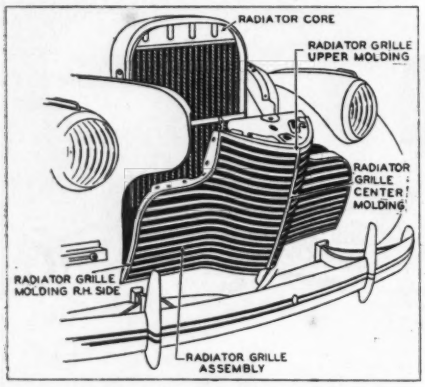
The large size lifters can be identified by the letter "B" which is stamped in the oil groove. The large size holes also have the letter "B" stamped beside the hole.

VALVE TIMING 1936-42 8 CYLINDER MODEL

With tappets at zero clearance, inlet valve opens at top center, exhaust valve closes 10 degrees after top center. Vibration damper is marked at top center for No. 1 cylinder. Marks on cam and crankshaft sprockets should be nearest each other and on line between the centers of the shafts.

CHEVROLET

SERVICE DATA



1940 radiator grille removal.

WINDSHIELD WIPER REMOVAL 1936-42

Remove windshield wiper blades and arms.

Remove screws holding transmission to cowl. Disconnect connecting links at wiper motor allowing links to drop down. Transmission can then be lifted from outside.

It will be necessary to remove glove-compartment box when removing transmission on the side above glove box.

Remove rubber-hose connection between main vacuum line and wiper motor.

Remove machine screws which hold wiper motor and mechanism to wiper support.

HORN BUTTON REMOVAL

All model standard wheels: Pry under button and lift out. De luxe wheels: Remove two cap screws underneath steering wheel and lift horn ring and button off.

1941-42 De luxe wheel: Rotate horn button anti-clockwise till button raises up and out.

GAS TANK REMOVAL 1939-42

Sedans

Drain gasoline and disconnect gas line.

Remove filler cap and filler neck.

Remove bolts from each side of tank and lower.

Disconnect tank gage wires.

Coupes

Raise rear deck lid, remove floor mat and floor board over the gas tank. Disconnect tank gage wires.

Remove filler neck and disconnect gas line.

Drain gas, remove hold down bolts and lift tank out of car.

GAS TANK REMOVAL 1936-48

Remove filler cap and drain gasoline.

Disconnect gas line.

Disconnect tail pipe at rear end.

Disconnect mounting brackets and lower tank.

ROD AND PISTON REMOVAL 1936-42

Rod and piston assemblies are removed from above.

Connecting rods should be assembled in the cylinder bore, with the piston pin clamp bolt to the camshaft side of the engine and the numbers on the cap also facing the camshaft.

VALVE GUIDE REMOVAL 1936-42

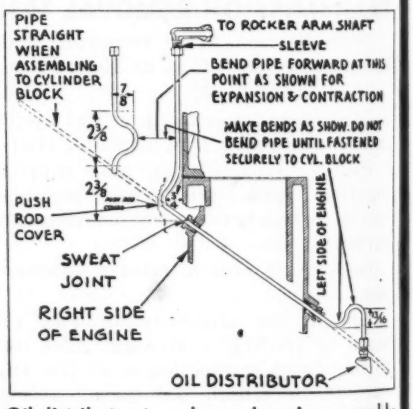
Place cylinder head in an arbor press and press guide through head from the top.

The valve guides do not have a shoulder to determine the distance they should be pressed into the cylinder head.

The intake guides should extend above the cylinder head 1 1/16 in. while the exhaust guide extends above the head 61/64 in.

PISTON CLEARANCES 1936-42

The piston to be fitted should be checked with a micrometer, measuring just below the lower ring groove and at right angles to the piston pin.


PIPE STRAIGHT WHEN ASSEMBLING TO CYLINDER BLOCK
TO ROCKER ARM SHAFT
SLEEVE
BEND PIPE FORWARD AT THIS POINT AS SHOWN FOR EXPANSION & CONTRACTION
MAKE BENDS AS SHOW. DO NOT BEND PIPE UNTIL FASTENED SECURELY TO CYL. BLOCK
7/8
2 3/8
2 3/8
PUSH ROD COVER
SWEAT JOINT
RIGHT SIDE OF ENGINE
LEFT SIDE OF ENGINE
OIL DISTRIBUTOR

Oil-distributor to valve-rocker-pipe assembly.

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance: Intake	VALVES: Operating Tappet Clearance: Exhaust	Rods Removed from	IGNITION: Spark Plug: Make and Model	IGNITION: Spark Plug: Gap	IGNITION: Timing: Spark Occurs—No. Deg.	IGNITION: Timing: Breaker Gap	IGNITION: Timing: Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN: Diameter	CRANK-PIN: Length	FRONT AXLE: Caster (Degrees)	FRONT AXLE: Camber (Degrees)	FRONT AXLE: Toe-in (Inches)	FRONT AXLE: Kingpin Inclination
EC, EA, ED.....1935	6-3 1/16x4	.006	1 1/16B	.006H	.013H	A	AC-K11	.032	5B	.018	35	5	...	86	2 1/16	1 3/32				
FD-Master Conv.....1936	6-3 1/16x4	.006	3 1/16B	.006H	.013H	A	AC-K11	.032	5B	.018	35	5	15	112	2 1/16	1 1/2	3±1/2	1±1/2	1/16–1/8	7 1/4
FA, FC.....1936	6-3 1/16x4	.006	3 1/16B	.006H	.013H	A	AC-K11	.032	5B	.018	35	5	15	112	2 1/16	1 1/2				
GA, GB.....1937	6-3 1/2x3 3/4	.006	9B	.006H	.013H	A	AC-K11	.040	5B	.020	35	5	14	112	2 1/16	1 1/16				
HA, HB.....1938	6-3 1/2x3 3/4	.006	9B	.006H	.013H	A	AC-46	.040	5B	.021	35	5	14	112	2 1/16	1 1/16	FA	FB	FC	FD
Master 85.....1939	6-3 1/2x3 3/4	.006	9B	.006H	.013H	A	AC-46	.040	5B	.021	35	5	14	112	2 1/16	1 1/16	2 1/4±1/2	1±1/2	1/4–1/8	4 1/2
Master Deluxe.....1939	6-3 1/2x3 3/4	.006	9B	.006H	.013H	A	AC-46	.040	5B	.021	35	5	14	112	2 1/16	1 1/16	0±1/2	1/4N±1/2	0–1/16	7°
Master 85.....1940	6-3 1/2x3 3/4	.006	3B	.006H	.013H	A	AC-44	.040	5B	.021	35	5	14	.....	2 1/16	1 1/2	2 1/4±1/2	1±1/2	1/4–1/8	4°
DL & MDL.....1940	6-3 1/2x3 3/4	.006	3B	.006H	.013H	A	AC-44	.040	5B	.021	35	5	14	.....	2 1/16	1 1/2	0±1/2	1/4N±1/2	0–1/16	4°
AG, AH, BG, BH 1941-42	6-3 1/2x3 3/4	.006	3B	.006H	.013H	A	AC-104	.040	5B	.018	39	5*	14*	110	2 1/16	1 1/2	0±1/2	1/4N±1/2	0–1/16	4°

The cylinder should be bored to the same diameter as the piston.

After cylinders have been rebored within .002 in. under the size desired, they should be finished or polished with a hone.

Hone cylinder until the piston you are fitting can be pushed through the cylinder on a .002 in. feeler, using a light pressure and locked on a .003 in. feeler. The feeler gage must be right angles to the piston pin.

SPARK PLUGS

Four types of plugs are recommended for various service and plug fouling conditions on the 1942 models.

AC 104—Passenger cars—all average service.

AC 104—Trucks—All average and heavy duty service.

AC 106 — Passenger cars — Where 104 plugs foul or cuts out due to oil or oxidation in low-speed operation.

Trucks—Where 104 plugs foul or cut out due to oil or oxidation in low-speed operation.

AC 108—Passenger cars, taxicabs, police cruising, or door-to-door delivery types of operation, where engines are idle considerably and the AC 106 fouls or cuts out due to oil or oxidation.

TRANSMISSION REMOVAL 1939-42

Remove the floor mat and the transmission cover from the body floor.

Remove the shift control rod from the reactionary lever.

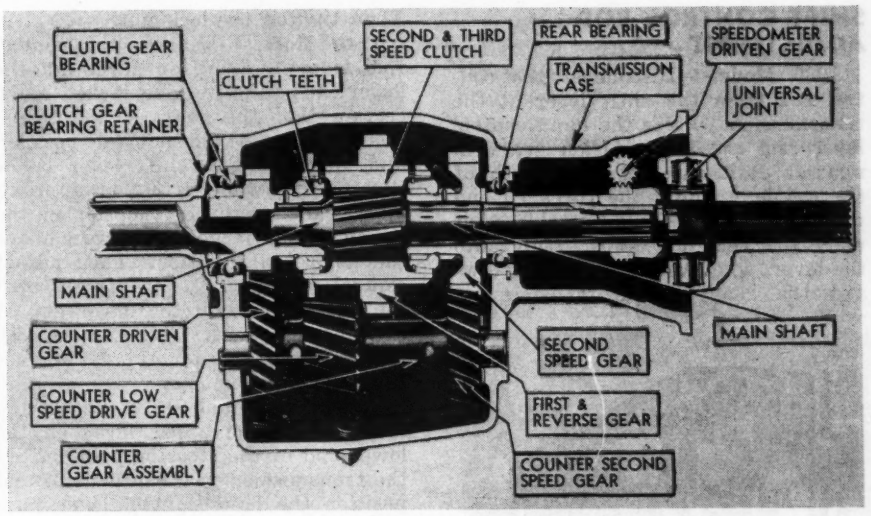
Remove the vacuum hose from the vacuum inlet stack. Then slip the forward end of the rubber boot off the rear end of the metal boot.

Remove the two bolts which fasten the two halves of the metal boot together, then lift off the top half of the boot.

Remove the piston-rod yoke clevis pin. Push the piston rod into the cylinder to disconnect it from the reactionary levers, then reinstall the clevis pin through the piston rod yoke and valve link to prevent upsetting the valve adjustment.

Remove the cotter pin and nut from the cylinder mounting stud and remove the unit.

Disconnect the pull rod and brake cables from the brake cross shaft, and remove the cross shaft. Disconnect



1940-42 Syncro-Mesh transmission.

the speedometer cable and driven gear assembly from the transmission case.

Remove cap screws holding the ball collar to the retainer, and slip the ball and collar back on the propeller shaft housing.

Remove the four cap screws which fasten the front trunnion needle bearings to the front yoke of the universal joint. Remove the two front yoke trunnion bearings and split the joint.

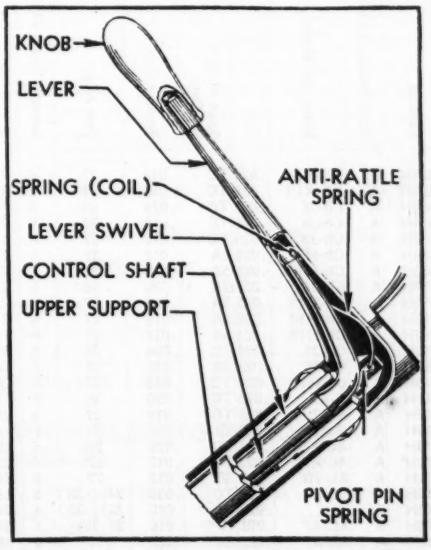
Remove the four bolts holding the rear transmission mounting to the frame cross member.

Remove the two top transmission to clutch housing cap screws, and insert two transmission guide pins in these holes.

Remove the flywheel underpan and remove the two lower transmission to clutch housing cap screws.

Slide the transmission straight back on the guide pins until the clutch gear shaft is free of the splines in the clutch disk. The use of the two guide pins during this operation will support the transmission and prevent damage to the clutch disk through springing.

Remove the transmission through the opening in the body floor.



Vacuum gearshift control lever assembly.

AXLE SHAFT REMOVAL 1936-42

Remove the road wheel.

Remove the two machine screws from the brake drum and remove the brake drum from the axle-shaft flange. Drain the lubricant from the differential and remove the housing cover.

Remove the differential pinion shaft lock screw, the differential pinion shaft and the axle shaft spacer. Rotate ring gear and remove pinions.

Push the axle shafts in toward the center of the axle and remove the "C" washers from the ends of the axle shafts.

After this has been done, the axle shafts can be removed from the axle housing.

The axle shafts are of different lengths, the longer one being used on the right side.

CHRYSLER

SERVICE DATA

SHIFT CONTROL ROD ADJUSTMENT

1939 Models—Disconnect the control rod from the shift lever at the transmission. Place the hand control lever and the transmission gears in neutral position. Set the length of the rod by turning the threaded end up or down into the adjustable joint until the rod just slips freely into the lever, when the lever is held toward the rear of the transmission. Then tighten the lock nut.

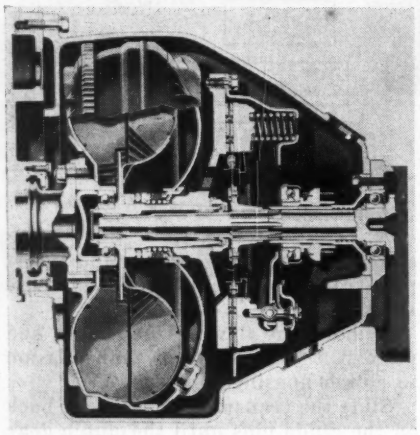
1940 Models—Remove the control rod from the shifter lever at the lower end of the steering jacket. Make certain that the gears in the transmission are in the neutral position and that the gear-shift lever below the steering wheel is set at approximately the center of the slot in the upper column jacket, 10 degrees above the horizontal position. Then adjust control rod until it slips freely over pin on the lever at the lower end of the steering jacket. Tighten the lock nut and replace cotter pin, flat washer and rubber grommet.

1941-42—Manual Shift—Loosen the lock bolt at the upper lever on the lower end of the steering column. Set the transmission gears in neutral and position the hand control lever in a horizontal position and then tighten the lock bolt.

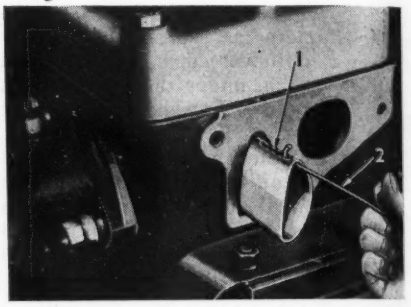
1940 Gear Selector Cable—Make certain that the gears in the transmission are in the neutral position. Loosen the lock nut on the selector cable at the transmission selector lever, then tighten the acorn nut until all play is removed from the cable and then back off the nut one-half turn for clearance.

1939 Gear Selector Cable—Loosen the clamping screw which holds the cable at the steering column end. Make certain that the hand control lever is in the neutral position. Loosen the screw at the steering column end until end play develops between the plunger end of the cable and the cloverleaf plate, then tighten the screw just enough to eliminate the end of play. When the adjustment is completed, tighten the clamping screw.

1941-42—Manual Shift—Place the transmission gear in neutral and loosen the lock nut on the selector rod at the transmission end. Tighten the nut until all play is removed and back off one-half turn for clearance.



1940-42 fluid drive and clutch assembly.

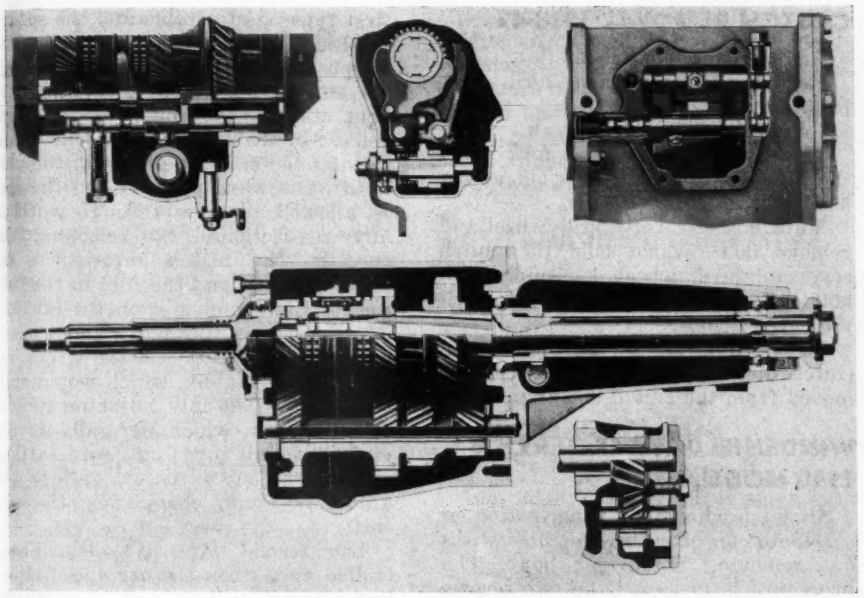


Removing water distributing tube from front of block (all models).

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance: Intake	VALVES: Operating Tappet Clearance: Exhaust	Rods Removed from	IGNITION: Spark Plug: Make and Model	IGNITION: Spark Plug: Gap	IGNITION: Timing: Spark Occurs—No. Deg.	IGNITION: Timing: Breaker Gap	IGNITION: Timing: Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN: Diameter	CRANK-PIN: Length	FRONT AXLE: Caster (Degrees)	FRONT AXLE: Camber (Degrees)	FRONT AXLE: Toe-in (Inches)	FRONT AXLE: Kingpin Inclination (Degrees)
C1-Airflow 1935	8-3¼x4⅞	.012	VDM	.006H	.008H	A	AC-KL9	.025	TC	.018	27	6	19	103	2⅜	1⅛	2	¼–¾	1/16–⅛	4
C2-Imp. Airflow 1935	8-3¼x4⅞	.012	VDM	.006H	.008H	A	AC-KL9	.025	TC	.018	31	6	19	110	2⅜	1⅛	2	¼–¾	1/16–⅛	4
C7-Airstream 1936	6-3⅜x4½	.010	VDM	.006H	.008H	A	Ch-J8	.025	TC	.020	38	6	19	99	2⅛	1⅛	1½	¼N–½P	0–⅛	9¾
C8-DeL. Airstream 1936	8-3¼x4⅛	.011	VDM	.006H	.008H	A	Ch-J8	.025	TC	.018	27	6	22	103	2⅜	1⅛	1½	¼N–½P	0–⅛	5¼
C-9-Airflow 1936	8-3¼x4⅞	.011	VDM	.006H	.008H	A	Ch-J8	.025	TC	.018	27	6	17	103	2⅜	1⅛	2	½±¼	0–⅛	5
C10-Airflow Imp. 1936	8-3¼x4⅞	.011	VDM	.006H	.008H	A	Ch-H10	.025	5A	.018	27	6	17	110	2⅜	1⅛	2	½±¼	0–⅛	5
C11-Arf. Cust. Imp. 1936	8-3¼x4⅞	.011	VDM	.006H	.008H	A	Ch-H10	.025	5A	.018	27	6	17	110	2⅜	1⅛	2	½±¼	0–⅛	5
C16-Royal 1937	6-3⅝x4¼	.014	TC	.008H	.010H	A	Ch-J8	.025	2A	.020	38	5	20	110	2⅛	1¼	1½	¼N–½P	0–⅛	4¾–6
C14-Imperial 1937	8-3¼x4⅛	.011	2B	.006H	.010H	A	Ch-H10	.025	3A	.018	27	6	22	110	2⅜	1⅛	1½	¼N–½P	0–⅛	4¾–6
C15-Custom Imp. 1937	8-3¼x4⅞	.011	2B	.006H	.010H	A	Ch-H10	.025	5A	.018	27	6	21	110	2⅜	1⅛	2	¼N–½P	0–⅛	4¾–6
C17-Airflow 1937	8-3¼x4⅞	.011	2B	.006H	.010H	A	Ch-H10	.025	5A	.018	27	6	18	110	2⅜	1⅛	2	¼–¾	0–⅛	4½–5¼
C18-Royal 1938	6-3⅝x4½	.014	8B	.008H	.010H	A	Ch-J8	.025	TC	.020	38	5	20	145†	2⅜	1⅜	½–2½	¼N–½P	0–⅛	4¾–6
C19-Imperial 1938	8-3¼x4¼	.011	2B	.006H	.010H	A	Ch-J8	.025	3B	.018	27	6	20	145†	2⅜	1⅛	½–2½	¼N–½P	0–⅛	4¾–6
C20-Cust. Imp. 1938	8-3¼x4⅞	.011	2B	.006H	.010H	A	Ch-H10	.025	TC	.018	27	6	20	155†	2⅜	1⅛	1–3	¼N–½P	0–⅛	4¾–6
C22-Royal 1939	6-3⅝x4¼	.014	8B	.008H	.010H	A	A-A7	.025	TC	.020	38	5	17	145†	2⅛	1⅜	½–2½	¼N–¾P	0–⅛	4¾–6
C23 1939	8-3¼x4⅞	.011	6B	.008H	.010H	A	A-A7	.025	TC	.018	27	6	24	155†	2⅜	1⅛	½N–1½P	¼N–½P	0–⅛	5¾–7
C24-Cust. Imp. 1939	8-3¼x4⅞	.011	6B	.008H	.010H	A	A-AL6	.025	3B	.018	27	6	24	155†	2⅜	1⅛	1–3	¼N–½P	0–⅛	4¾–6
Winds. & Royal C25 1940	6-3⅜x4½	.014	12B	.008H	.010H	A	AL-A7B	.025	TC	.020	38	5	18	145†	2½	1⅜	N1–+1	0–¾	0–⅛	4¾–6
Saratoga & N.Y. C26 1940	8-3¼x4⅞	.011	6B	.008H	.010H	A	AL-A7B	.025	TC	.017	27	6	24	155†	2⅜	1⅛	N1–+1	0–¾	0–¾	4¾–6
Crown Imp. C27 1940	8-3¼x4⅞	.011	6B	.008H	.010H	A	AL-7B	.025	3B	.017	27	6	24	155†	2⅜	1⅛	N1–+1	0–¾	0–⅛	4¾–6
C28S, C28W 1941	6-3⅜x4½	.014	12B	.008H	.010H	A	.....	.025	TC	.020	34½–38	5	18	112	2⅛	1⅜	1N–1P	0–+¾	0–⅛	4¾–6
C30N, C30K N. Y. 1941	8-3¼x4⅞	.011	6B	.008H	.010H	A	.....	.025	TC	.018	34½–38	6	24	150	2⅜	1⅛	1N–1P	0–+¾	0–⅛	4¾–6
C33, C36 1941-42	8-3¼x4⅞	.011	6B	.008H	.010H	A	AL-A7	.025	3B*5	.018	27–30½	6	24*4	125	2⅜	1⅛	1N–1P	0–+¾	0–⅛	4¾–6
C34 1942	6-3 7/16x4½	.014	12B	.008H	.010H	A	AL-A7	.025	2A	.020	.....	5	18	125	2⅛	1⅜	1N–1P	0–+¾	0–1/16	4¾–6

CHRYSLER

SERVICE DATA



1940-41 transmission without overdrive

POWER SHIFT LUBRICATION 1941-42

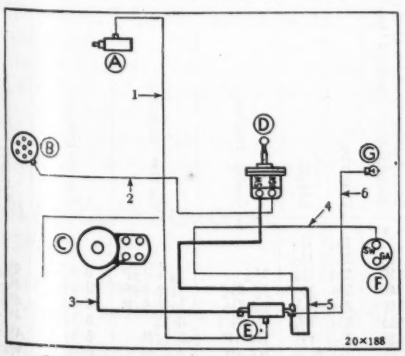
In the event a sluggish operation of the power shift is apparent, it may be due to the necessity of lubrication inside the power unit. Lubricate as follows:

Remove leather boot.

Remove vacuum line at cylinder and also air cleaner line at cylinder.

Remove power pin from cylinder yoke and castellated nut from cylinder anchor stud.

Remove cylinder as an asembly, being careful not to turn internal valve yoke or damage it. Reinsert power pin immediately to prevent turning valve yoke in relation to cylinder yoke. Adjustment of valve yoke will upset the balance of the cylinder.



Overdrive solenoid wiring diagram.

Mount cylinder horizontally in vise, clamping at mounting stud and locate piston rod in mid-position.

While holding valve rod in "full in" position, pour in ½ oz. of shock absorber, ice machine or transformer oil in vacuum stack. Allow sufficient time for oil to run through valve port into cylinder.

TRANSMISSION REMOVAL 1937-42

Remove floor mat and floor board.

Remove propeller shaft. If the transmission is to be disassembled, loosen the companion flange nut at this point.

Disconnect speedometer cable and battery ground cable at transmission.

Disconnect gear shift control rod and gear shift selector cable at transmission.

Disconnect hand brake cable at brake band.

Remove nuts and lock washers which hold the transmission to the clutch housing.

Remove transmission assembly by pulling it back, down and out of car.

MAIN BEARING REMOVAL 1935-38

Drain engine oil and remove oil pan.

Remove oil-suction-pipe cover and screw assembly.

Remove the clutch-housing pan.

Remove radiator and fenders as an assembly.

Remove timing-chain-case cover.

Remove screw from timing-case-cover plate to oil-pan front gasket oil-seal plate, which will permit the removal of the front main-bearing cap.

Remove bearing caps.

Remove bearings by rotating crankshaft.

PISTON CLEARANCES 1935-42

With the piston pin removed, fit piston so there is .001 in. clearance between the thrust side of piston at bottom of skirt and cylinder wall at normal room temperature 70 degree F. This clearance can be measured by using a piece of .002 in. feeler stock attached to a scale which, when withdrawn from between the high point of the piston and cylinder wall should read from 5 to 7 lb. pull on a scale.

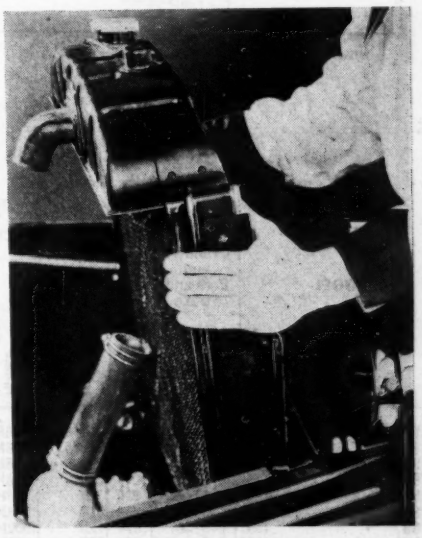
HORN BUTTON REMOVAL 1938-42

Disconnect the horn wire at the bottom of the steering gear.

Remove the screws from the underside of the steering-wheel hub and lift off the horn-blowing ring and cover.

Remove the screws which hold the wire and spring retainer to the steering wheel hub.

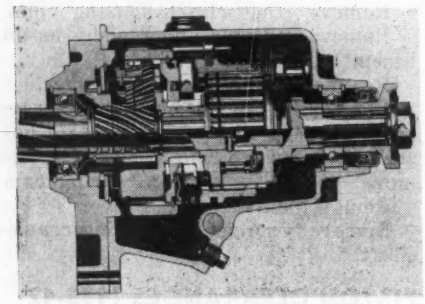
Pull the wire out of the steering tube.



Removing radiator core 1940 models.

DE SOTO

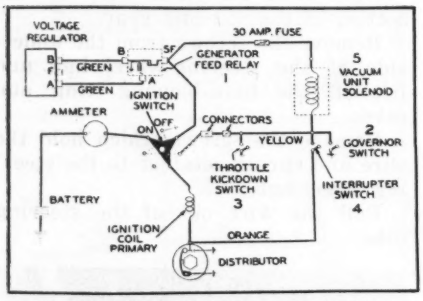
SERVICE DATA



1938-40 transmission overdrive.

PISTON CLEARANCES

With the piston pin removed, fit piston so there is .001 in. clearance between the thrust side of piston at bottom of skirt and cylinder wall at normal room temperature, 70 degrees F. This clearance can be measured by using a piece of .002 in. feeler stock attached to a scale which, when withdrawn from between the high point of the piston and cylinder wall, should read from 5 to 7 lb. pull on a spring scale.



Simplimatic transmission control wiring diagram.

CLUTCH REMOVAL 1938-42

Remove transmission.

Remove clutch-release fork pull-back spring.

Remove clutch-housing pan.

Disconnect the release fork from the pivot and pull the fork out as far as it will go.

Mark clutch cover and flywheel and remove bolts which hold the clutch cover to the flywheel, loosening each bolt a few turns in succession until the cover is loose.

The clutch cover assembly and clutch disc assembly can then be removed from the clutch housing.

WINDSHIELD-WIPER SERVICE 1940 MODELS

Sluggish windshield-wiper action on a DeSoto can often be overcome without removing the wiper body. The procedure is to loosen the two screws which hold the trip valve cover to the wiper body. If these screws are too tight, they force the cover inward, causing it to bind on the trip valve.

WINDSHIELD WIPER REMOVAL 1941-42

Remove wiper arms and blades.

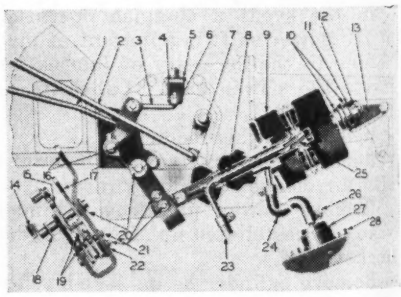
Disconnect electrical wire at connection.

Remove screws holding wiper assembly to dash and lift out assembly.

CARBURETOR DASH POT

On DeSoto cars using the Simplimatic transmission, there are two types of carburetor dash pots. The first type is adjustable and the second type is a solenoid-controlled unit. The purpose of this dash pot is to permit the slow closing of the throttle to prevent stalling the motor upon sudden release of the accelerator pedal. When driving the car, the piston in the unit is in its upward position and the fuel is allowed to pass through without any restrictions. By releasing the throttle, the piston returns to its lower position and the fuel in the bottom of the chamber is then restricted and must pass through a small opening, preventing the piston from returning too rapidly, which would stall the motor. The only adjustment is a slotted screw which normally is set about five full turns out. Any farther adjustment outward will affect the automatic gear change on the upshift.

The second type is solenoid-controlled and, when the car speed is below 8 m.p.h. in low, and 15 m.p.h. in high, the transmission governor points close which energizes the dash pot solenoid and raises the core. This al-



Transmission power shift.

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance: Intake	VALVES: Operating Tappet Clearance: Exhaust	Rods Removed from	IGNITION: Spark Plug: Make and Model	IGNITION: Spark Plug: Gap	IGNITION: Timing: Spark Occurs—No. Deg.	IGNITION: Timing: Breaker Gap	IGNITION: Timing: Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN: Diameter	CRANK-PIN: Length	FRONT AXLE: Caster (Degrees)	FRONT AXLE: Camber (Degrees)	FRONT AXLE: Toe-in (Inches)	FRONT AXLE: Kingpin Inclination (Degrees)
SF, SG 1935	6-3⅛x4½	.010	VDM	.006H	.008H	A	AC-K9	.025	3A	.020	38	6	17	.....	2⅛	1⅛	.....	.....	.....	.....
S1, S2 1936	6-3⅛x4½	.010	VDM	.006H	.008H	A	Ch-J8	.025	TC	.020	38	6	19	.....	2⅛	1⅛	.....	.....	.....	.....
S3 1937	6-3⅛x4¼	.014	TC	.008H	.010H	A	Ch-J8	.025	2A	.020	38	5	20	110	2⅛	1¼	1½	¼N–½P	0–⅛	4¼–6
S5 1938	6-3⅛x4¼	.014	8B	.008H	.010H	A	A-A7	.025	TC	.020	38	5	20	145†	2⅛	1⅜	½–2½	¼N–½P	0–⅛	4¼–6
S6 1939	6-3⅛x4¼	.014	8B	.008H	.010H	A	A-A7	.025	2B	.020	38	5	19	145†	2⅛	1⅜	½–2½	¼N–¾P	0–⅛	4¼–6
S7 1940	6-3⅛x4¼	.014	12B	.008H	.010H	A	AL-A7B	.025	2B	.020	38	5	17	150†	2⅛	1⅜	N1–+1	0–¾	0–⅛	4¼–6
S8 1941	6-3⅛x4½	.014	12B	.008H	.010H	A	.....	.025	.....	.020	34½–38	5	26	120	2⅛	1⅜	1N–1P	0–¾P	0–⅛	4¼–6
S10 1942	6-3 1/16x4½	.014	12B	.008H	.010H	A	AL-A7	.025	4A	.020	.....	5	18	125	2⅛	1⅜	N1–P1	0–+¾	0–1/16	4¼–6

DE SOTO

SERVICE DATA

lows the piston to move in a downward position and the ball seats itself, restricting the opening and causing the throttle to close slowly.

When the car speed is above 8 m.p.h. in low or 15 m.p.h. in high, the transmission governor points are open and the core is then held down by a spring, preventing the ball from seating and allowing the fuel to pass through the fuel passage without any restrictions.

HORN BUTTON REMOVAL 1938-42

Disconnect the horn wire at the connector between the bottom of the steering gear and the horn.

Remove the four screws from the underside of the horn-blowing ring and cover and lift off.

Remove horn-blowing ring and retainer.

Remove screws which hold the contact plate and spring retainer to the steering-wheel hub.

Pull the wire out of the steering tube. The terminal of the wire is pressed into the connector and is removed by pushing it out of the retainer.

TRANSMISSION REMOVAL 1939-42

Remove floor mat and floor board.

Remove propeller shaft. If the transmission is to be disassembled, loosen the companion flange nut at this point.

Disconnect speedometer cable and battery ground-cable at transmission.

Disconnect gear-shift control rod and gear-shift selector cable at transmission.

Disconnect hand brake cable at brake band.

Remove nuts and lock washers which hold the transmission to the clutch housing.

Remove transmission assembly by pulling it back, down and out of car.

AXLE SHAFT REMOVAL 1935-42

Remove wheel.

Remove axle-shaft cotter pin and nut.

Remove hub and brake-drum assembly.

Disconnect brake line from wheel cylinder.

Remove stud nuts which hold the oil seal and brake support to the axle housing, and remove oil seals and brake support.

Remove axle shaft and bearing.

GAS TANK REMOVAL 1937-42

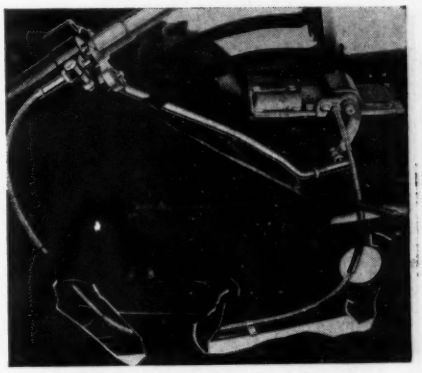
Drain gasoline and disconnect tail pipe at rear end. Remove tank support bolts and disconnect gas line. Disconnect gas gage wire and remove the tank.

GEAR SELECTOR ROD ADJUSTMENT

1941-42—Set the gears in the transmission in the neutral position. Loosen the lock nut on the selector rod at the bottom of the steering column. Tighten the nut until all play is removed from the rod, then back the nut off one-half turn for clearance. Tighten the lock nut.

GEAR SHIFT CONTROL ROD ADJUSTMENT

1941-42—Loosen the clamp-bolt nut on the upper lever at the lower end of the steering column. Be sure that the transmission gears are in the neutral position and that the gear-shift lever is set at horizontal position. Then tighten the clamp bolt lock nut.

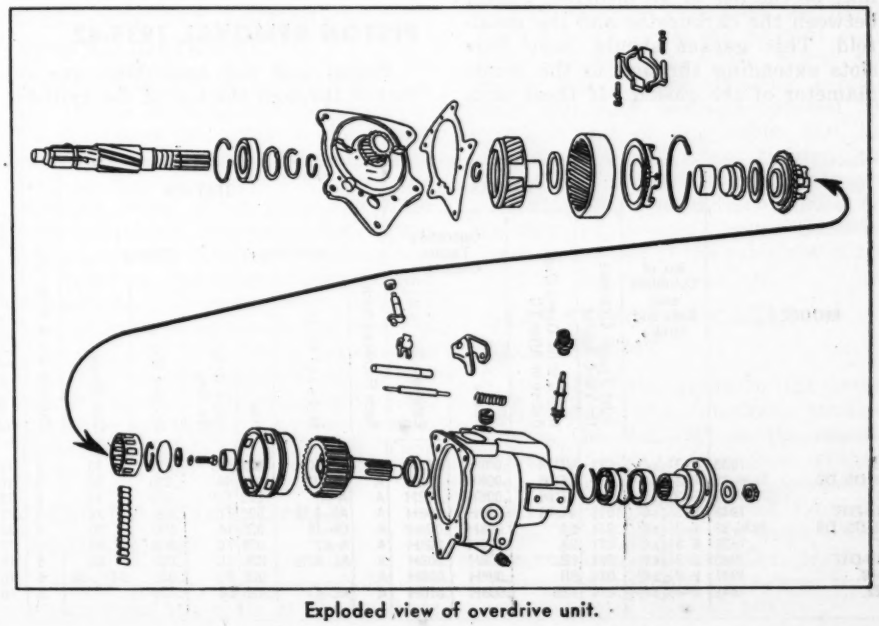


1939 remote control gearshift.

SLOW IDLE 1941 MODELS

When servicing the DeSoto cars equipped with the Simplimatic transmission, an occasional complaint may be encountered of the throttle sticking open, preventing the engine from returning to a slow idle speed.

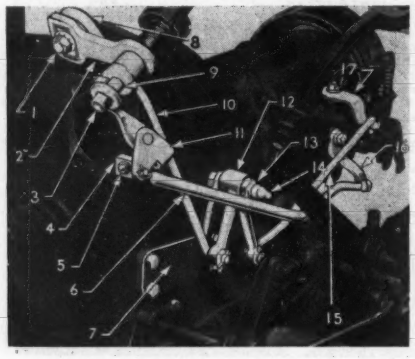
These cases can be corrected by installing a spring (Carter No. 61-119) between the dash-pot lifter link and the throttle arm. Drill a No. 52 hole in the lifter link and another in the throttle arm and install the spring between these two points.



Exploded view of overdrive unit.

DODGE

SERVICE DATA



1941-42 gearshift control rods.

"A" AND "B" ENGINE NUMBERS

On 1937 Dodge cars, the letter "A" with the engine number indicates "special standard" cylinder bores, which is a .020 in. larger standard. The letter "B" with the engine number indicates "special standard" main and connecting-rod bearings which is a .010 in. smaller standard. The letters in the circular pad at each end of the engine number pad are for the use of factory inspectors only and should not be used in connection with the engine number.

GAS MILEAGE

A contributing factor to high gasoline consumption in the 1941 Dodge may be the use of an incorrect gasket between the carburetor and the manifold. This gasket should have four slots extending through to the inside diameter of the gasket. If these slots are not present, the vacuum economizer in the carburetor will not operate properly.

HORN BUTTON REMOVAL 1939-42

Disconnect the horn wire at the connector between the bottom of the steering gear and the horn.

Remove the screws from the underside of the steering-wheel hub and lift off the horn-blowing ring and cover.

Remove the screws which hold the wire and spring retainer to the steering-wheel hub.

Pull the wire out of the steering tube. The terminal of the wire is pressed into the connector and is removed by pushing it out of the connector.

DOOR ADJUSTMENT

If the edge of the front door of the 1942 Dodge scratches the paint on the body when the door is opened, loosen the hinges and raise the door about 1/16 in., which will provide sufficient clearance.

GAS TANK REMOVAL 1939-42

Drain gasoline and disconnect tail pipe at rear end. Remove tank support bolts and disconnect gas line. Disconnect gas-gage wire and remove the tank.

PISTON REMOVAL 1935-42

Piston and rod assemblies are removed through the top of the cylinder block. When installing connecting rods, squirt hole should be on camshaft side of the engine.

MAIN BEARINGS REMOVAL 1939-42

Remove the oil pan, clutch-housing pan and oil-pump strainer.

Remove the crankshaft-pulley splash shield.

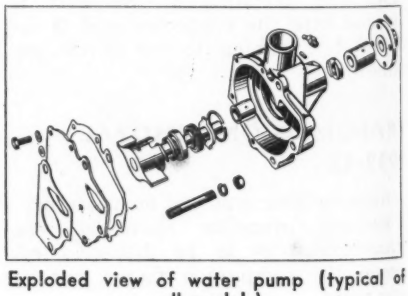
On Model C-28, remove the two lower screws from the chain-case cover to the oil-pan front-end oil-seal plate.

On Model C-28, remove the oil-pan front-end oil-seal plate, loosen the bearing caps and remove one bearing shell at a time as follows:

Remove one of the bearing caps, insert a cotter pin or a nail in crankshaft hole and rotate the crankshaft.

To check main bearing clearance proceed as follows:

Coat a piece of .002 in. feeler stock, ½ in. wide and 1 in. long, with oil and place it between the bearing and the crankshaft journal, turn the cap



Exploded view of water pump (typical of all models).

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance: Intake	VALVES: Operating Tappet Clearance: Exhaust	Rods Removed from	IGNITION: Spark Plug: Make and Model	IGNITION: Spark Plug: Gap	IGNITION: Timing: Spark Occurs—No. Deg.	IGNITION: Timing: Breaker Gap	IGNITION: Timing: Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN: Diameter	CRANK-PIN: Length	FRONT AXLE: Caster (Degrees)	FRONT AXLE: Camber (Degrees)	FRONT AXLE: Toe-In 'Inches'	FRONT AXLE: Kingpin Inclination (Degrees)
DU 1935	6–3¼x4⅜	.011	VDM	.006H	.008H	A	AC-K9	.025	4A	.020	38	5	17	110	2 1/16	1	2	½±¼	0–5/16	9½
D2, D5, D8 1936-38	6–3¼x4⅜	.011	VDM	.006H	.008H	A	Ch-J8	.025	4A	.020	38	5	15	140†	2 1/16	1	1–3	¼–¾	0–⅛	4½–5½
D11 1939	6–3¼x4⅜	.011	VDM	.006H	.008H	A	A-A7	.025	TC	.020	38	5	15	140†	2 1/16	1	⅛N–1½P	¼N–½P	0–⅛	5¼–5⅝
D14-D17 1940	6–3¼x4⅜	.011	VDM	.008H	.008H	A	AL-A7B	.025	TC	.020	38	5	15	145†	2 1/16	1	N1–+1	0–¾	0–⅛	4¾–5
D2, D5, D8 1936-38	6–3¼x4⅜	.011	6A	.006H	.008H	A	Ch-J8	.025	4A	.020	38	5	15	140†	2 1/16	1	1–3	¼–¾	0–⅛	4½–5½
D11 1939	6–3¼x4⅜	.011	6A	.006H	.008H	A	A-A7	.025	TC	.020	38	5	15	140†	2 1/16	1	⅛N–1½P	¼N–½P	0–⅛	5¼–5⅝
D14-D17 1940	6–3¼x4⅜	.011	6B	.008H	.008H	A	AL-A7B	.025	TC	.020	38	5	15	145†	2 1/16	1	N1–+1	0–¾	0–⅛	4¾–5
D-19 1941	6–3¼x4⅜	.014	9B	.008H	.010H	A		.025	TC	.020	34½–38	5	15		2 1/16	1	1N–1P	0–¾P	0–⅛	4¾–5
D22 1942	6–3¼x4⅜	.014	12B	.008H	.010H	A	AL-A7	.025	2A	.020		5	15	125	2 1/16	1	1N–1P	0–¾P	0–1/16	4¾–5

nuts up tight. If the clearance is not excessive, a slight drag will be noticeable when the crankshaft is turned. The correct clearance should be .001 in. to .002 in.

CLUTCH REMOVAL 1935-42

Remove transmission.

Remove clutch-release fork pull-back spring.

Remove clutch-housing pan.

Disconnect the release fork from the pivot and pull the fork out as far as it will go.

Mark the clutch cover and flywheel and remove bolts which hold the clutch cover to the flywheel, loosening each bolt a few turns in succession until the cover is loose.

The clutch cover assembly and clutch disc assembly can then be removed from the clutch housing.

TRANSMISSION REMOVAL 1935-42

Remove floor mat and floor board.

Remove propeller shaft. If the transmission is to be disassembled, loosen the companion flange nut at this point.

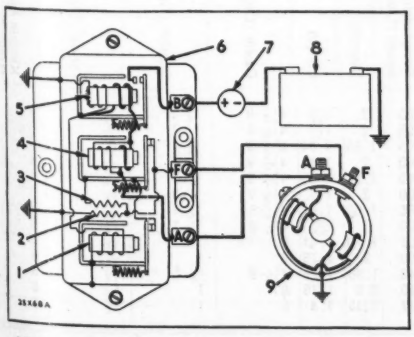
Disconnect speedometer cable and battery ground-cable at the transmission.

Disconnect gear-shift control rod and gear-shift selector cable at transmission. On 1935-38 models remove the cover and shift-lever assembly.

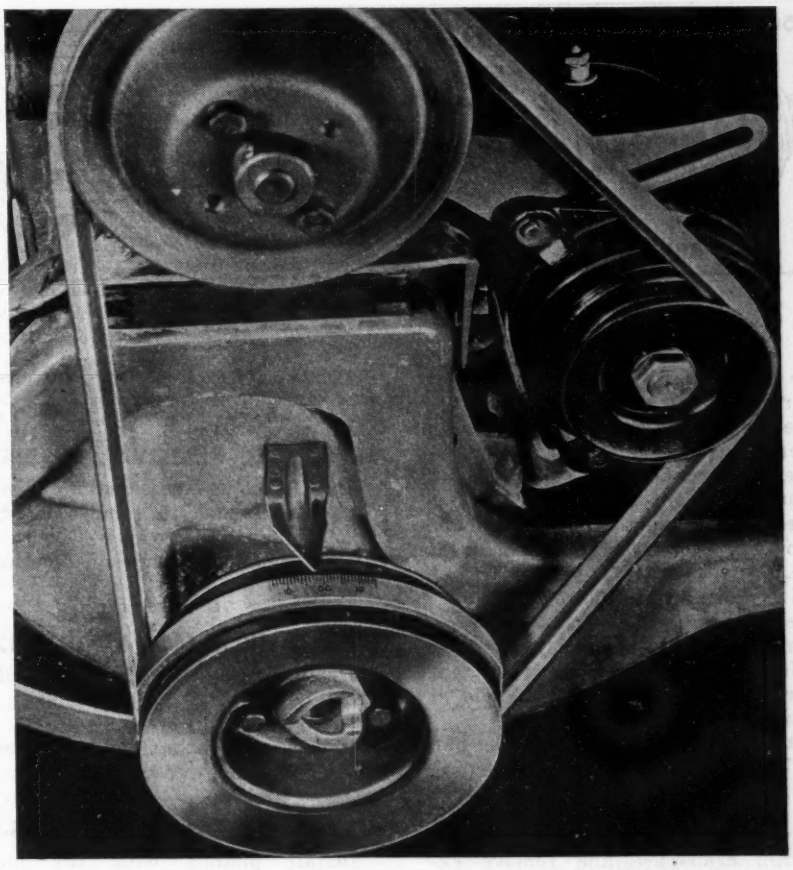
Disconnect hand-brake cable at brake band.

Remove nuts and lock washers which hold the transmission to the clutch housing.

Remove transmission assembly by pulling it back, down and out of the car.



1941 generator regulator wiring diagram.



Timing marks located on vibration damper on all models.

GEAR-SHIFTER CONTROL ROD ADJUSTMENT

1939—Remove the control rod from the shifter lever at the transmission. Be sure that the gears in the transmission are in the neutral position as well as the hand-control lever at the steering wheel. When these are properly positioned, the end of the control rod should slip freely into place when the lever on the transmission is held toward the rear of the car to take up the ⅛ in. free movement. If the rod does not slip into place, loosen the lock nut at the threaded end of the rod in or out of the adjustable joint until the rod length is properly set to permit the rod to enter in place. Then tighten the lock nut.

GEAR SELECTOR CABLE ADJUSTMENT

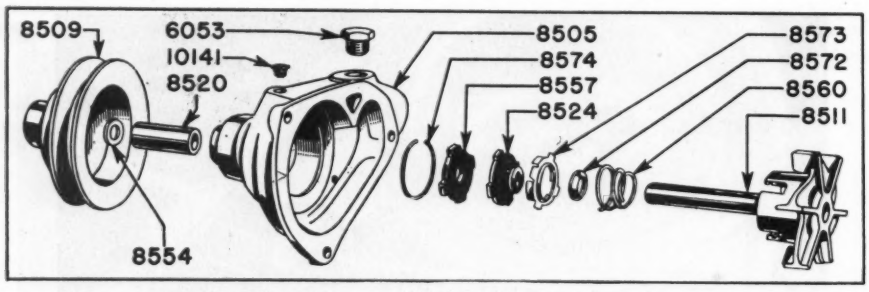
1939—Loosen the clamp-bolt nut which holds the cable at the steering column end. Be sure that the hand-control lever is in the neutral position. Loosen the screw below the clamp bolt on the steering column until end play develops between the plunger end of the cable and the cloverleaf plate, then tighten the screw just enough to eliminate the end play. This adjustment must not be tight as it would cause excessive wear at the end of the cable and plate. Tighten the clamp-bolt nut.

GEAR SELECTOR CABLE ADJUSTMENT

1940—Set the gears in the transmission in the neutral position. Loosen the lock nut on the selector cable at the transmission selector lever. Then tighten the acorn nut until all play is removed from the cable. Then back off the acorn adjusting nut one-half turn for clearance. After the correct clearance is obtained tighten the lock nut.

FORD

SERVICE DATA



Water pump used on 1941 six-cylinder models.

OIL PAN REMOVAL

Drain cooling system.

Remove upper hoses and disconnect lower hoses.

Remove front engine support bolts.

Jack up front of engine 4 in.

Remove exhaust cross pipe and disconnect exhaust pipe on the right side.

Disconnect drag-link rod.

Remove engine side pans.

Remove starter assembly.

Disconnect radius rod at rear mounting, using a block to hold it down.

Remove cap screws holding the pan and lower the pan to the floor.

OIL PAN REMOVAL 1941-42 V-8

Drain crankcase and remove exhaust cross pipe. Remove oil dip-stick guide and starter assembly. Disconnect drag link at Pitman arm. Remove cap screws holding the crankcase and lower to floor.

FLYWHEEL REMOVAL 1935-42

On V8, it is necessary to remove oil pan in order to remove flywheel (See Oil Pan Removal).

This is not necessary on 6-cylinder models.

GAS TANK REMOVAL 1937-42

Drain gas tank and remove filler neck.

Disconnect gage wire.

Remove bolts that holds the tank to frame and lower tank to floor.

PISTON INSTALLATION 1935-42

Install pistons with the mark "Ford" toward front of engine and skirt splits facing to the left side of engine.

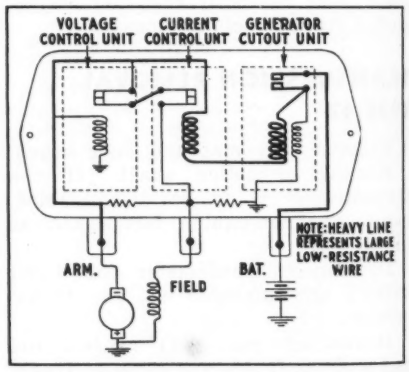
PISTON CLEARANCES 1935-42

Flat-head type pistons and dome-type pistons are not interchangeable. This is true of both steel and aluminum pistons.

Aluminum pistons all are of the split-skirt and "T" slot type and require different limits in fitting to the cylinder. Feeler blade should be placed on side of piston opposite slot in skirt when checking pistons of the split-skirt type.

When installing standard or oversize aluminum pistons in the 85 hp. engine, a .002 in. feeler blade should be used with a 6 to 10 lb. pull on the pull scale.

In the 60 h.p. engine, only steel pistons have been used, both in standard and oversize.



Wiring circuit of generator control, starting with 1938.

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance: Intake	VALVES: Operating Tappet Clearance: Exhaust	Rods Removed from	IGNITION: Spark Plug: Make and Model	IGNITION: Spark Plug: Gap	IGNITION: Timing: Spark Occurs—No. Deg.	IGNITION: Timing: Breaker Gap	IGNITION: Timing: Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN: Diameter	CRANK-PIN: Length	FRONT AXLE: Caster (Degrees)	FRONT AXLE: Camber (Degrees)	FRONT AXLE: Toe-In (Inches)	FRONT AXLE: Kingpin Inclination (Degrees)
48-V8 1935	8-3 1/16x3 3/4	.013	3B	.013C	.013C	A	Ch-18	.025	4B	.013	††	5	22	105	2	1 1/2	4 1/2-9	1/4-1	3/32	8
68-V8 1936	8-3 1/16x3 3/4	.013	3B	.013C	.013C	A	Ch-18	.025	4B	.013	††	5	22	105	2	1 1/2	4 1/2-9	1/4-1	1/16	8
74-V8 (60 Hp.) 1937	8-2.6x3.2	.013	3 1/4B	.013C	.013C	A	Ch-H10	.025	4B	.015	††	4	15	105	1.60	1.54	4 1/2-9	1/4-1	1/16	8
78-V8 (85 Hp.) 1937	8-3 1/16x3 3/4	.013	TC	.013C	.013C	A	Ch-18	.025	4B	.015	††	5	22	100	2	1 1/2	4 1/2-9	1/4-1	1/16	8
82A-V8 (60 Hp.) 1938	8-2.6x3.2	.013	3 1/4B	.013C	.013C	A	Ch-H10	.025	4B	.015	††	4	15	105	1.60	1.54	4 1/2-9	1/4-1	1/16	8
81A-V8 (85 Hp.) 1938	8-3 1/16x3 3/4	.013	TC	.013C	.013C	A	Ch-H10	.025	4B	.015	††	5	22	100	2	1 1/2	4 1/2-9	1/4-1	1/16	8
922A-V8 (60 Hp.) 1939	8-2.6x3.2	.013	3 1/4B	.013C	.013C	A	Ch-H10	.025	4B	.015	††	4	15	105	1.60	1.54	4 1/2-9	1/4-1	1/16	8
91A-V8 (85 Hp.) 1939	8-3 1/16x3 3/4	.013	TC	.013C	.013C	A	Ch-H10	.025	4B	.015	††	5	R	100	2	1 3/4	4 1/2-9	1/4-1	1/16	8
V8-60 1940	8-2.6x3.2	.013	3 1/4B	.013C	.013C	A	Ch-J10	.025	4B	.015	††	4	13	105	1.70	1.41	8	1	1/16	8
V8-85 1940	8-3 1/16x3 3/4	.013	TC	.013C	.013C	A	Ch-J10	.025	4B	.015	††	5	22	100	2	1.75	8	1	1/16	8
Deluxe & Super 1941	8-3.06x3.75	.....	TC	.011C	.011C	A	Ch-H10	.025	4B	.015	††	5	23 3/4	140	1.99	1.75	4 1/2-9	1/4-1	1/16	8
V-8 1942	8-3.06x3.75	.....	TC	.012C	.015C	A	Ch-H10	.025	4B	.015	††	5	22	110	2.0	1.75	8	1	1/8	8
8 1942	6-3.30x4.40	.....	3B	.013C	.013C	A	.....	.032	2B	.015	††	5	.....	117	2.235	1.4	8	1	1/8	8

† Total dwell of right and left hand points 35°. Dwell of right or left hand points, 22½°.

FORD SERVICE DATA

The steel pistons are fitted by using a .002 in. feeler blade with a 7 to 12 lb. pull on the pull scale.

TRANSMISSION REMOVAL 1935-42

Remove rear axle assembly (See Rear Axle Assembly Removal).

Disconnect gear-shifting rods.

Remove cap screws holding transmission to engine and disconnect clutch pedal cross shaft.

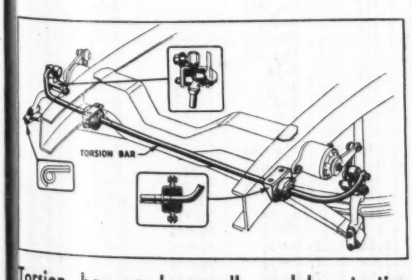
Remove transmission using care not to spring clutch hub while sliding drive pinion out of clutch hub.

PINION BEARINGS

As a means of identification on Ford pinion bearings, the letter "P" is stamped on the 48-4621 bearings now being supplied for service. Bearings having this marking are now being held to closer limits than those previously supplied, thus assuring a more accurate location of the differential drive pinion. Always use a 48-4621 bearing having the letter "P" next to the drive pinion gear. Bearings 48-4621 not having the letter "P" marking that are now in stock can be used on the forward end of the pinion gear.

INSTALLING UNIVERSAL JOINT

In assembling a universal joint to the transmission main shaft on all Ford products, make sure that the screw is drawn down tight and the washer is seated in the counterbore of the universal joint. When correctly assembled, the main-shaft rear bearing hub is against the shoulder of the main shaft and is held in this position by the universal joint. The outer race of the main shaft bearing is held in position by the rear motor support. If there is any play in the main-shaft, it will permit the synchronizer to change its location with respect to the second-speed mainshaft gear and cause transmission failure.



Torsion bar used on all models, starting with 1940.

WATER PUMP IMPELLER

It is very important, in case of any pump impeller failure on 1937 Ford engines, that a thorough check be made for any obstruction in the cylinder block which road conditions and also the force of circulating water might bring in contact with the pump impeller. A casual inspection is not enough, since the obstruction is usually forced back into the block by the revolving impeller. It is also very important, in case of impeller breakage on the 60 h.p. motor water pump, that you be sure to retrieve both parts of the broken impeller. Locating any foreign material or obstructions can be done by removing the hose at the water-inlet connection in the block and checking from this point with a small light as well as checking through the pump hole. Then flush the block through the cylinder-head water outlet with high-pressure water, omitting the pump from the block and also disconnecting the inlet hose from the block.

REAR AXLE ASSEMBLY REMOVAL 1935-42

Place rear of car where rear end can be hoisted or jacked up.

Remove floor mat and floor boards.

Disconnect speedometer cable.

Remove rear spring clips.

Disconnect torque tube at universal joint.

Raise rear of car.

Disconnect brake lines.

Disconnect shock absorber links and slide rear axle assembly from rear of car.

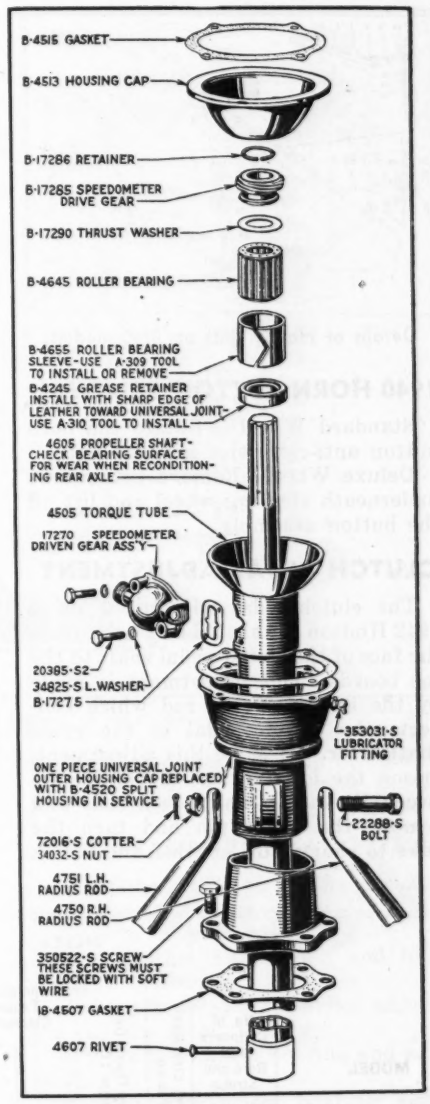
AXLE SHAFT REMOVAL 1935-42

Remove hubs and drums and drain oil from housing.

Disconnect spring shackle on left side.

Remove bolts around left side housing and remove.

Slide differential and axles out from left side.


B-4515 GASKET
B-4513 HOUSING CAP
B-17286 RETAINER
B-17285 SPEEDOMETER DRIVE GEAR
B-17290 THRUST WASHER
B-4645 ROLLER BEARING
B-4655 ROLLER BEARING SLEEVE-USE A-309 TOOL TO INSTALL OR REMOVE
B-4245 GREASE RETAINER INSTALL WITH SHARP EDGE OF LEATHER TOWARD UNIVERSAL JOINT-USE A-310 TOOL TO INSTALL
4605 PROPELLER SHAFT-CHECK BEARING SURFACE FOR WEAR WHEN RECONDITIONING REAR AXLE
4505 TORQUE TUBE
17270 SPEEDOMETER DRIVEN GEAR ASS'Y
20385-S2
34825-S L. WASHER
B-17275
353031-S LUBRICATOR FITTING
ONE PIECE UNIVERSAL JOINT OUTER HOUSING CAP REPLACED WITH B-4520 SPLIT HOUSING IN SERVICE
22288-S BOLT
72016-S COTTER
34032-S NUT
4751 L.H. RADIUS ROD
4750 R.H. RADIUS ROD
350522-S SCREW-THESE SCREWS MUST BE LOCKED WITH SOFT WIRE
18-4507 GASKET
4607 RIVET

Forward end of driveshaft and torque-tube assembly.

Remove ring gear bolts and separate housing.

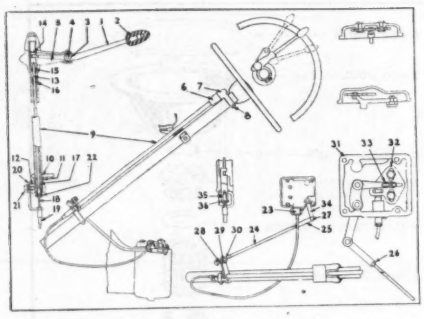
Remove axle shafts.

BRAKE CAM ADJUSTMENT

To set anchor adjustments on Ford hydraulic brakes, turn cam for the forward shoe until the shoe is tight against the drum. Then just barely move it back until the wheel turns freely by hand. No set amount of clearance is specified for these brakes as the least amount possible is desirable.

HUDSON

SERVICE DATA



Details of Handy shift on 1940 models.

1940 HORN BUTTON REMOVAL

Standard Wheel — Rotate the horn button anti-clockwise and lift out.

Deluxe Wheel—Remove two screws underneath steering wheel and lift off the button assembly.

CLUTCH PEDAL ADJUSTMENT

The clutch-pedal adjustment on a 1942 Hudson car should be 1½ in. from the face of the clutch-pedal shaft to the toe boards. This adjustment is made by the length of the rod which connects the clutch pedal to the cross shaft lever. To make this adjustment, loosen the lock nut on the clevis between the upper and lower rods and remove the clevis pin and turn the yoke to shorten or lengthen the rod as necessary. On the model 20, except with the overdrive, Hudson drive master, vacumotive drive and a 3-in. bore by 5-in. stroke engine, use the inner hole of the top lever and the outer hole of the bottom lever. On the models 21 and 20, with a 3-in. bore and a 5-in. stroke engine, use the outer hole of the top lever and the outer hole of the bottom lever. On the models 22, 24, 25, 27, 28 and all six-cylinder cars, with overdrive, Hudson drive master and vacumotive drive, use the outer hole of the top lever and the center hole of the bottom lever.

VALVE TAPPET CLEARANCES

Valve tappet clearances for the 1941 Hudson cars are set at .006 in. intake and .008 in. exhaust, unless otherwise indicated. In some cases, the valve cover plates carry instructions for setting the tappets of that particular motor at .010 in. intake and .012 in. exhaust, hot. When these instructions appear on the cover plates of the job you are working on, disregard the general specifications and use those given on the cover plate.

PISTON CLEARANCES 1936-42

Pistons should be fitted with a .0015 in. feeler gage used directly opposite the skirt slot with a pull of 3 to 4 lb. on feeler scale.

CONNECTING ROD INSTALLATION 1936-42

Connecting rod must be installed with dipper on lower cap facing camshaft side of engine. Connecting rods are right and left hand, the big end being offset on the rod proper. Rod and piston assemblies are removed from above.

Six-Cylinder Engines

Connecting rods 1-2 and 4 are right hand.

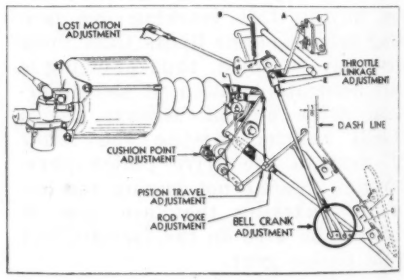
Connecting rods 3-5 and 6 are left hand.

Eight-Cylinder Engines

Connecting rods 1-3-5-7 are right hand.

Connecting rods 2-4-6-8 are left hand.

Bearing clearance should be .001 in.



Clutch vacuum-control linkage adjustment.

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance Intake	VALVES: Operating Tappet Clearance Exhaust	Rods Removed from	IGNITION: Spark Plug Make and Model	IGNITION: Spark Plug Gap	IGNITION: Timing Spark Occurs—No. Deg.	IGNITION: Timing Breaker Gap	IGNITION: Timing Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN Diameter	CRANK-PIN Length	FRONT AXLE Caster (Degrees)	FRONT AXLE Camber (Degrees)	FRONT AXLE Toe-in (Inches)	FRONT AXLE Kingpin Inclination (Degrees)
GH 1935	6-3x5	.010	2¼B	.006H	.008H	A	Ch-J7	.025	TC	.020	38	6	18	103	1⅛	1⅜	3¼–3¾	.....	0–⅛	7
HT-HU-HHU-HTL 1935	8-3x4½	.010	4B	.006H	.008H	BA	Ch-J7	.025	TC	.020	27½	7	23	104	1⅛	1⅜	4–4½	1–1½	0–⅛	7
63 1936	6-3x5	.010	4B	.006H	.008H	A	Ch-J8	.025	TC	.020	38	6	13	103	1⅛	1⅜	3½–4½	1–1½	0–⅛	7
64-5-6-7 1936	8-3x4½	.010	4B	.006H	.008H	BA	Ch-J8	.025	TC	.020	27½	7	20	104	1⅛	1⅜	3½–4½	1–1½	0–⅛	7
73 1937	6-3x5	.008	10⅔B	.008H	.010H	A	Ch-J8	.025	TC	.020	35	5	20	80	1⅛	1⅜	0–½	1–1½	0–⅛	7
74-5-6-7 1937	8-3x4½	.008	10⅔B	.008H	.010H	BA	Ch-J8	.025	TC	.020	27½	7	20	80	1⅛	1⅜	0–½	1–1½	0–⅛	7
89 (112) 1938	6-3x4⅛	.006	10⅔B	.006H	.008H	A	Ch-J8A	.032	TC	.020	35	6	12⅛	115	1⅛	1⅜	2–3	1–1½	0–⅛	7
83 1938	6-3x5	.006	10⅔B	.006H	.008H	A	Ch-J8A	.032	TC	.020	35	6	12½	120	1⅛	1⅜	2–3	1–1½	0–⅛	7
84-5-7 1938	8-3x4½	.006	10⅔B	.006H	.008H	A	Ch-J8A	.032	TC	.017	27½	9	17½	118	1⅛	1⅜	2–3	1–1½	0–⅛	7
90-98 (112) 1939	6-3x4⅛	.....	10⅔B	.006H	.008H	A	Ch-J8A	.032	D	.020	35	6	12⅛	115	1⅛	1⅜	1½±½	1–1½	0–⅛	7
92-93 1939	6-3x5	.....	10⅔B	.006H	.008H	A	Ch-J8A	.032	TC	.020	35	6	12½	120	1⅛	1⅜	1½±½	1–1½	0–⅛	7
95-97 1939	8-3x4½	.....	10⅔B	.006H	.008H	A	Ch-J8A	.032	TC	.017	27½	9	17.2	118	1⅛	1⅜	1½±½	1–1½	0–⅛	7
Six & DeL. 6 1940	6-3x4⅛	.....	10⅔B	.006H	.008H	A	Ch-J8A	.032	TC	.020	35	6	13	125	1⅛	1⅜	0±¼	½±¼	⅓±⅓	3° 38′
Super & CC 6 1940	6-3x5	.....	10⅔B	.006H	.008H	A	Ch-J8A	.032	TC	.020	27½	6	13	120	1⅛	1⅜	0±¼	½±¼	⅓±⅓	3° 38′
Eight & CC 8 1940	8-3x4½	.....	10⅔B	.006H	.008H	A	Ch-J8A	.032	TC	.017	34	9	18	119	1⅛	1⅜	0±¼	½±¼	⅓±⅓	3° 38′
Series 10, 20 1941-42	6-3x4⅛	.....	10⅔B*6	.006H*7	.008H*8	A	Ch-J9	.038	TC*9	.020	34	6	13	125	1.94	1.37	0±¼	½±¼	⅓±⅓	3° 38′
Series 11,12,21,22 1941-42	6-3x5	.....	10⅔B*8	.008H	.008H	A	Ch-J9	.038	TC*9	.020	30½	6	13	120	1.94	1.37	0±¼	½±¼	⅓±⅓	3° 38′
Series 14, 24, 25 1941-42	8-3x4½	.....	10⅔B	.006H	.008H	A	Ch-J9	.038	TC	.017	.....	9	18	119	1.94	1.37	0±¼	½±¼	⅓±⅓	3° 38′
Series 17, 27 1941-42	8-3x4½	.....	10⅔B	.006H	.008H	A	Ch-J9	.038	TC	.017	.....	9	18	119	1.94	1.37	0±¼	½±¼	⅓±⅓	3° 38′

HUDSON

SERVICE DATA

CRANKSHAFT PIN SIZE CODE

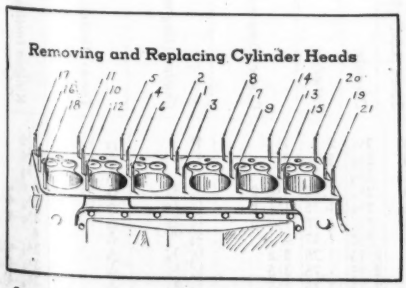
Identification marks are stamped on the surface of the cylinder block at the left front corner, covered by the oil pan gasket on the 1942 Hudson car. These letters, which can be seen without removing the oil pan, designate the size crankshaft pins and journals. PU means that the crankshaft has .010 in. undersize crank pins. MU means that the crankshaft has .010 in. undersize crankshaft bearing journals. PUM means that the crankshaft has .010 in. undersize crank pins and also .010 in. undersize crankshaft bearing journals.

REMOVING VALVE TAPPET

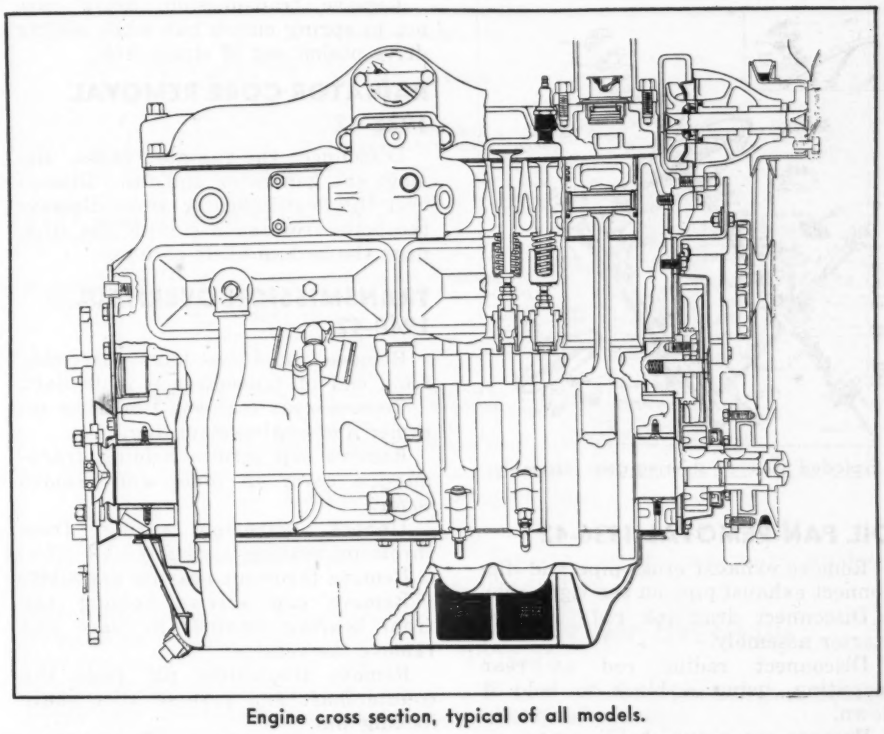
To remove the valve tappet from the motor on a 1940 Hudson car after the right front wheel, fender plate and valve cover have been removed and with the piston on the compression stroke in relation to the tappet to be removed, raise the valve spring and valve as high as possible so that the tappet-adjusting screw, spring seat, and dampener can be removed. Then raise the valve tappet guide out of its place, allowing the valve tappet to rest on the cam. In this position the valve tappet and guide can then be removed.

MAIN BEARINGS REMOVAL 1936-42

Main-bearing shells are held in the block and the bearing caps by screws. To renew main bearings it is necessary to remove engine. Main bearings are furnished to size and require no hand fitting or reaming. End thrust is taken at the center main bearing flange in the six-cylinder engine and at the No. 3 main bearing flange in the eight-cylinder engine.



Sequence of tightening cylinder-heat nuts (all models).



Engine cross section, typical of all models.

VIBRATION DAMPER REMOVAL 1942-41

Remove from underneath of car without removal of radiator core.

Remove radiator lower panel center molding.

Remove front bumper bracket bolts and allow bumper to drop.

Loosen generator mounting bolts and remove fan belt.

Remove the starting crank jaw.

Remove vibration damper.

WATER PUMP OVERHAUL 1936-42

Disassembly

Remove fan blades and fan belt pulley.

Remove stud nuts holding pump impeller housing to pump body.

Press pump shaft out of impeller.

Disassemble the water-pump-impeller assembly by taking out the seal retaining spring, seal thrust washer, shaft seal, seal retainer and seal compression spring.

Reassembly

Reverse the disassembly procedure. Note: When assembling the pump shaft the end play between the pulley flange and the front bushing should be from .010 in. to .014 in.

AXLE SHAFT REMOVAL 1936-42

Raise the rear end of the car and place on stand jacks.

Remove the rear wheel.

Remove the brake drum and hub, using a puller.

Remove rear-wheel bearing adjusting cap and shim.

Remove rear-wheel bearing and axle shaft.

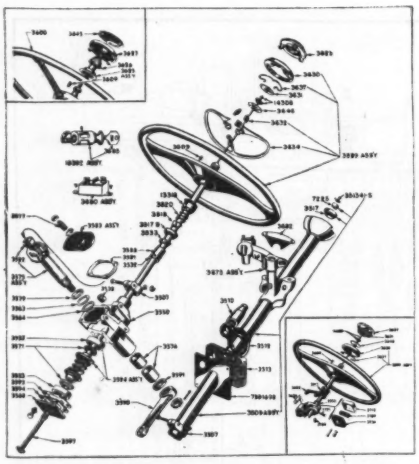
Remove rear-wheel bearing cone from axle shaft.

BRAKE OPERATION

On the 1942 Hudson, the mechanical brakes on the rear wheels will operate if the hydraulic system for any reason becomes inoperative. To prevent the mechanical brakes from operating during the normal operation of the hydraulic brakes, a clearance of 1¼ in. should be maintained between rear face of the pedal push-rod adjustable end nut and the front face of the pedal push rod. This adjustment should be checked on every car whenever brake work or inspection is done.

LINCOLN

SERVICE DATA



Exploded view of steering-gear assembly.

OIL PAN REMOVAL 1936-42

Remove exhaust cross pipe and disconnect exhaust pipe on the right side.

Disconnect drag-link rod. Remove starter assembly.

Disconnect radius rod at rear mounting, using a block to hold it down.

Remove cap screws holding pan.

TRANSMISSION REMOVAL 1940-42

Remove rear axle assembly.

Disconnect gear shifting rods.

Remove cap screws holding transmission to engine and disconnect clutch-pedal cross shaft.

Remove transmission, using care not to spring clutch hub while sliding drive pinion out of clutch hub.

RADIATOR CORE REMOVAL 1936-42

Disconnect the radiator hoses. Remove the generator and fan. Disconnect the heat-indicator wire. Remove the bolts from each side of the core, near the bottom. Lift core out.

TRANSMISSION OVERHAUL 1940-42

Remove universal-joint assembly from end of transmission mainshaft.

Remove rear mainshaft-bearing retainer and engine mounting.

Remove cap screws holding transmission cover in place and remove cover.

Unhook retractor spring from throwout bearing assembly.

Remove throwout bearing assembly.

Remove cap screws holding the front bearing retainer in place and remove the retainer.

Remove the cotter pin from the countershaft and reverse idler shaft locking pin.

Drive out the countershaft and reverse idler shaft locking pin.

Drive out the countershaft.

Slide out the clutch shaft and main drive gear.

Remove the mainshaft rear bearing.

Remove the mainshaft and gears.

Remove the countershaft gear cluster and thrust washers.

Drive out the reverse idler shaft.

Remove the reverse idler gear.

Remove the pilot bearing from the main drive gear.

Remove the low and reverse sliding gear from the mainshaft.

Remove mainshaft bearing spacer.

Remove the mainshaft snap ring.

Remove the intermediate and high clutch sleeve and hub.

Remove the mainshaft thrust washer intermediate gear and rear thrust washer.

AXLE SHAFT REMOVAL 1936-42

Remove hubs and drums and drain oil from housing.

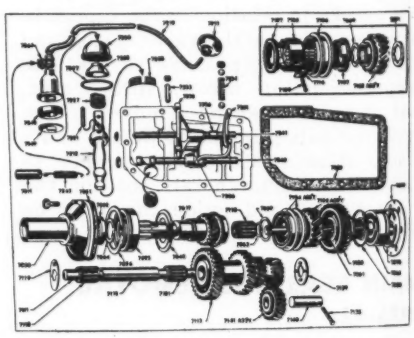
Disconnect shackle on left side.

Remove bolts around left side housing.

Slide differential and axles out from left side.

Remove ring gear bolts and separate housing.

Remove axle shafts.



Order in which transmission parts are assembled.

MODEL		No. of Cylinders and Bore and Stroke	VALVES				Rods Removed from	IGNITION					Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN		FRONT AXLE			
					Operating Tappet Clearance			Spark Plug		Timing						Diameter	Length	Caster (Degrees)	Camber (Degrees)	Toe-in (Inches)	Kingpin Inclination (Degrees)
			Inlet Tappet Clearance for Valve Timing	Intake Valve Opens Deg. Before or After TC	Intake	Exhaust		Make and Model	Gap	Spark Occurs—No. Deg.	Breaker Gap	Cam Angle									
321, 322	1936	12-3 1/8x4 1/2	.004	6 3/4B	.004C	.006C	B	Ch-7	.025	TC	.020	36	12	32	108	2 1/2	2	1 1/2	1	1/16-1/8	7 1/2
351	1937	12-3 1/8x4 1/2	AA	CSM	AA	AA	B	Ch-7	.025	TC	.020	36	12	32	108	2 1/2	2	8	1	1/16-1/8	7 1/2
401 to 425	1938-39-40	12-3 1/8x4 1/2	AA	6 3/4B	AA	AA	B	Ch-7	.029	7B	.020	36	12	32	105	2 1/2	2	1 1/2	1	1/16-1/8	7 1/2
Zephyr 900	1936	12-2 5/8x3 3/4	.013	6B	.013C	.013C	A	Ch-J9	.025	4B	.015	††	6	27	105	2 1/8	1.75	4 1/2-9	1/4-3/4	1/16-1/8	3 3/4-4
Zephyr HB	1937	12-2 5/8x3 3/4	.013	6B	.013C	.013C	A	Ch-J9	.029	4B	.015	††	6	27	105	2 1/8	1.75	1 1/2-6	1/4-3/4	1/16-1/8	3 3/4-4
Zephyr 700, 96H	1938-39	12-2 5/8x3 3/4	AA	4 1/4B	AA	AA	A	Ch-H10	.029	4B	.015	††	5	30	105	2 1/8	1.75	1 1/2-6	1/4-3/4	1/16-1/8	3 3/4-4
Zephyr V12	1940	12-2 7/8x3 3/4	AA	6 3/4	AA	AA	A	Ch-H10	.029	4B	.015	††	5	27	105	2 1/8	1.57	4	3/4	1/16	4
Zephyr & Cont.	1941	12-2.87x3.7	HA	10 2/3B	HA	HA	A	Ch-H10	.029	4B	.015	††	5	27	.....	2.13	1.75	3-5	1/4-3/4	1/16	3 3/4-4 1/4
Custom	1941	12-2.87x3.7	HA	10 2/3B	HA	HA	A	Ch-H10	.029	4B	.015	††	5	27	.....	2.13	1.75	3-5	1/4-3/4	1/16	3 3/4-4 1/4
Zephyr, All	1942	12-2.93x3.75	HA	10 2/3B	HA	HA	A	Ch-H10	.029	4B	.015	††	5	27	125	2.13	1.75	3-5	1/4-3/4	1/16	3 3/4-4 1/4

††—Firing interval 37 1/2 and 22 1/2 Cam degrees.

MERCURY

SERVICE DATA

GAS TANK REMOVAL 1939-42

Drain gas tank and remove filler neck.

Disconnect gas gage wire.

Remove mounting bolts and lower tank to floor.

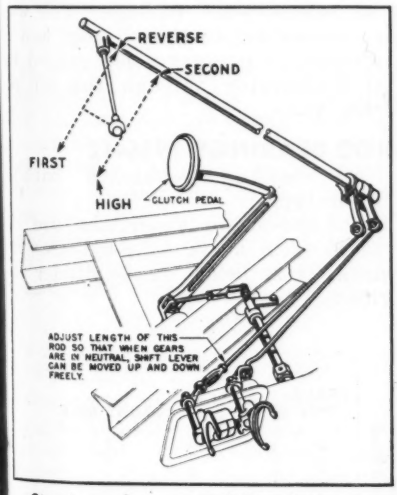
GAS TANK GAGE REMOVAL 1939-42

Remove metal cover over tank gage and disconnect gage wire.

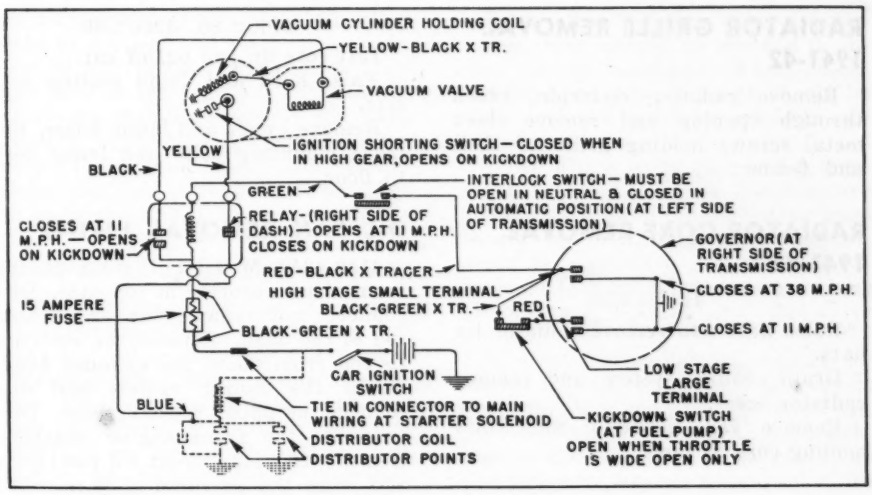
Remove cap screws and lift out the gage.

CAMSHAFT REMOVAL 1939-42

Camshaft and gear may be removed without removing valves by blocking up on lifters and inserting a nail in each lifter hole. Cam gear is bolted on camshaft.


REVERSE
SECOND
FIRST
HIGH
CLUTCH PEDAL
ADJUST LENGTH OF THIS ROD SO THAT WHEN GEARS ARE IN NEUTRAL, SHIFT LEVER CAN BE MOVED UP AND DOWN FREELY.

Steering-column gearshift adjustment.


VACUUM CYLINDER HOLDING COIL
YELLOW-BLACK X TR.
VACUUM VALVE
IGNITION SHORTING SWITCH—CLOSED WHEN IN HIGH GEAR, OPENS ON KICKDOWN
YELLOW
BLACK
GREEN
INTERLOCK SWITCH—MUST BE OPEN IN NEUTRAL & CLOSED IN AUTOMATIC POSITION (AT LEFT SIDE OF TRANSMISSION)
CLOSES AT 11 M.P.H.—OPENS ON KICKDOWN
RELAY-(RIGHT SIDE OF DASH)—OPENS AT 11 M.P.H. CLOSES ON KICKDOWN
GOVERNOR (AT RIGHT SIDE OF TRANSMISSION)
RED-BLACK X TRACER
HIGH STAGE SMALL TERMINAL
CLOSES AT 38 M.P.H.
15 AMPERE FUSE
BLACK-GREEN X TR.
RED
CLOSES AT 11 M.P.H.
BLACK-GREEN X TR.
CAR IGNITION SWITCH
LOW STAGE LARGE TERMINAL
BLUE
TIE IN CONNECTOR TO MAIN WIRING AT STARTER SOLENOID
KICKDOWN SWITCH (AT FUEL PUMP) OPEN WHEN THROTTLE IS WIDE OPEN ONLY
DISTRIBUTOR COIL
DISTRIBUTOR POINTS

Liquimatic drive wiring diagram.

MAIN BEARINGS REMOVAL 1939-42

Remove oil pan.

Remove oil pump.

Remove main bearing cap and insert a cotter pin in the crankpin hole.

Rotate the crankshaft and the upper bearing will follow.

PISTON CLEARANCES 1939-42

Pistons should be fit with a feeler gage .002 in. thick. A pull of 7 to 12 lb. should be required to move the feeler gage.

VALVE GUIDES REMOVAL 1939-42

Remove valve-guide lock and pry out valve guide with valve spring and lock.

Remove spring keeper and guides will separate.

WATER PUMP OVERHAUL 1939-42

Drive out lock pin holding pump pulley on shaft.

Remove pulley and push impeller and shaft out of body.

Remove thrust washer, packing, packing washer and spring.

HORN BUTTON REMOVAL 1940-42

Push down and rotate button till it raises up and out.

FLYWHEEL REMOVAL 1939-42

It is necessary to remove oil pan to remove flywheel.

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance: Intake	VALVES: Operating Tappet Clearance: Exhaust	Rods Removed from	IGNITION: Spark Plug: Make and Model	IGNITION: Spark Plug: Gap	IGNITION: Timing: Spark Occurs—No. Deg.	IGNITION: Timing: Breaker Gap	IGNITION: Timing: Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN: Diameter	CRANK-PIN: Length	FRONT AXLE: Caster (Degrees)	FRONT AXLE: Camber (Degrees)	FRONT AXLE: Toe-in (Inches)	FRONT AXLE: Kingpin Inclination (Degrees)
1939	8-3 3/16 x3 3/4	.013	TC	.013C	.013C	A	Ch-H10	.025	4B	.015	††	5	21	100	2 2/16	1 3/4	4 1/2 -9	1/4 -1	1/16	8
1940	8-3.187x3 1/2	.013	TC	.013C	.013C	A	Ch-H10	.025	4B	.015	††	5	21	100	2.14	1.75	4 1/2 -9	1/4 -1	1/16 -1/8	8
1941	8-3.18x3.75	.012	TC	.012C	.012C	A	Ch-H10	.025	4B	.015	††	5	23 1/4	100	2.14	1.75	4 1/2 -9	1/4 -1	1/16	8
1942	8-3.18x3.75	.015	TC	.012	.015	A	Ch-H10	.025	4B	.015	††	5	22	100	2.14	1.75	3-5	1/4 -3/4	1/16	8

††—Total dwell of right and left hand points 35 deg. Dwell of right or left hand points 22½ deg.

NASH

SERVICE DATA

RADIATOR GRILLE REMOVAL 1941-42

Remove radiator underpin, reach through opening and remove sheet metal screws holding grille to shell and fender.

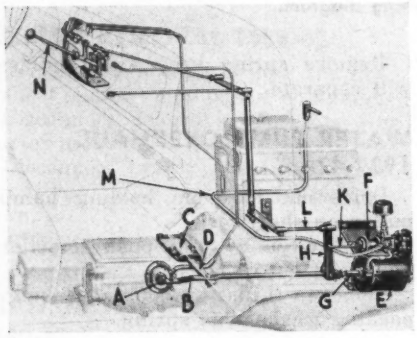
RADIATOR CORE REMOVAL 1941-42

4140=4240

Raise hood and remove radiator tie bars.

Drain cooling system and remove radiator hoses.

Remove fan assembly and bolts holding core to shell.



Vacuum gearshift used on 3800 series.

4160=80, 4260=80

Lift core up and out of car.

Raise hood and drain cooling system.

Remove upper and lower hoses. Remove mounting bolts and lower core to floor.

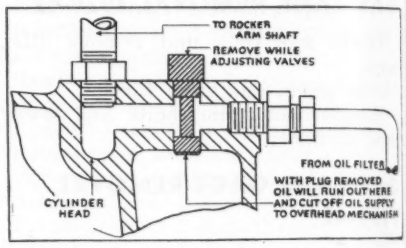
OIL PAN REMOVAL 1941-42

4140-4240 Models: Disconnect the front shock absorber at top ends. Disconnect and remove the accelerator rod to the dash. Remove the steering tie-rod from above the cylinder head. Drain the cooling system and disconnect the upper radiator hose. Disassemble the front engine shackles. Remove the four front oil-pan bolts and raise the engine 4 to 5 in. with a jack placed at the front engine support just behind the vibration damper, after which, remove the remaining oil-pan bolts and drop the pan.

Replace the oil pan, then check caster, camber and toe-in.

HIGH OIL PRESSURE 1941-42

Excessive oil pressure, if experienced with the 1941 Nash "600," may be due to the oil-pressure relief valve being air-bound. The relief valve is located on the outside of the block adjacent to the crankshaft rear intermediate bearing.


TO ROCKER ARM SHAFT
REMOVE WHILE ADJUSTING VALVES
FROM OIL FILTER
WITH PLUG REMOVED OIL WILL RUN OUT HERE —AND CUT OFF OIL SUPPLY TO OVERHEAD MECHANISM
CYLINDER HEAD

Cutoff for overhead oiling when adjusting valves.

There is an air vent in the block, indicated by "plunger vent," the purpose of which is to allow the column of air compressed by the plunger to escape and not offer resistance to the movement of the plunger. If this vent becomes clogged, excessive pressure will result.

The oil by-passed by the plunger returns to the crankcase through the "oil release well" passage. The well is spot-welded to the oil pan and is intended to prevent noise caused by oil discharging through the oil release valve.

ROD BEARINGS 1936-42

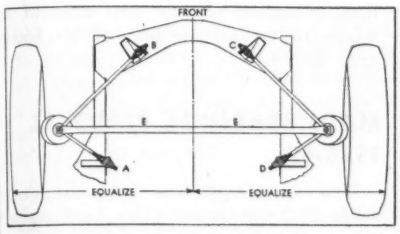
All models, steel-backed babbitt, slip-in type.

Rod-and-piston assemblies are removed from above on 6-cylinder engines, from below on 8-cylinder engines.

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance: Intake	VALVES: Operating Tappet Clearance: Exhaust	Rods Removed from	IGNITION: Spark Plug: Make and Model	IGNITION: Spark Plug: Gap	IGNITION: Timing: Spark Occurs—No. Deg.	IGNITION: Timing: Breaker Gap	IGNITION: Timing: Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN: Diameter	CRANK-PIN: Length	FRONT AXLE: Caster (Degrees)	FRONT AXLE: Camber (Degrees)	FRONT AXLE: Toe-in (Inches)	FRONT AXLE: Kingpin Inclination
3640-400-Std. 4 . . 1935-36	6-3⅜x4⅜	. . . .	CSM	.015H	.015H	A	AC-G8	.025	VDM	.020	33	7	18	83	2	1 19/64	2½	0–1½	1/8	7
3640A-400 DeL. 6 . . 1936	6-3⅜x4⅜	.015	CSM	.015H	.015H	A	AC-G8	.025	VDM	.020	38	7	18	83	2	1 19/64	2½	0–1½	1/8	7
3620-Amb.Twn.Ign.6 1936	6-3⅜x4⅜	.015	CSM	.015H	.015H	A	AC-K7	.025	VDM	.020	35	7	17½	93	2	1 7/64	2½	0–1½	1/8	7
3680-Amb.Twn.Ign.8 1936	8-3⅛x4¼	.015	CSM	.015H	.015H	B	AC-K12	.025	VDM	.018	28	7	21	81	2	1 7/64	2½	0–1½	1/8	7
3720-Ambassador 6 . . 1937	6-3⅜x4⅜	.008	24B	.008H	.015H	A	AC-45	.027	1B	.022	35	7	17	93	2	1 21/64	2½	1½	1/8	7
3780-Ambassador 8 . . 1937	8-3⅛x4¼	.008	20B	.008H	.015H	B	AC-45	.027	9B	.020	28	7	18	93	2	1 15/64	2	1½	1/8	7
3820-Amb. 6 1938	6-3⅜x4⅜	.008	CSM	.008H	.015H	A	AC-45	.025	4B	.022	35	7	20	125▼	2	. . . .	1½	1½	0	7
3880-Amb. 8 1938	8-3⅛x4¼	.015	CSM	.015H	.015H	B	AC-45	.025	9B	.015	28	7	18	125▼	2	1.24	1½	1½	0	7
3920-Amb. 6 1939	6-3⅜x4⅜	.015	24½B	.015H	.015H	A	AC-45	.025	6B	.020	35	6	16	125▼	2	1 27/64	1½	1½	0–1/16	7
3980-Amb. 8 1939	8-3⅛x4¼	.015	20B	.015H	.015H	B	AC-45	.025	9B	.020	28	7	17	110▼	2	1 15/64	1½	1½	0–1/16	7
40-20 1940	6-3⅜x4⅜	.015	24½B	.015H	.015H	A	AC-45	.025	6B	.020	35	6	16	125	2	1.42	0–N½	¼–¾	1/32–3/32	4½
40-80 1940	8-3⅛x4¼	.015	20B	.015H	.015H	B	AC-45	.025	9B	.020	28	7	17	110	2	1.24	0–N½	¼–¾	1/32–3/32	5° 30'
Amb. 6-4140 1941	6-3⅛x3¾	.019	6B	.015	.015	A	AL-AN7	.025	TC	.021	35	5	14	120	1.99	1.25	0–0	0–½	0–1/16	4° 30'
Amb. 6-4160 1941	6-3⅜x4⅜	.015	24½B	.015	.015	A	AC	.025		.020	35	6	17	125	2.00	1.43	0–½N	¼–¾	1/32–3/32	4° 30'
Amb. 8-4180 1941	8-3⅛x4¼	.015	20B	.015	.015	A	AC	.025	9B	.017	28	7	16	110	2.00	1.24	0–½N	¼–¾	1/32–3/32	5½
4240 1942	6-3⅛x4¾	.019	19B	.015	.015	A	AL-AN7	.025	TC	.020	35	5	14	120	1⅞	1¼	0–½	0–½	0–1/16	4½
4260 1942	6-3⅜x4⅜	.015	14B	.015	.015	A	AC-45	.025	4B	.020	35	6	17	125	2.00	1.43	0–½	¼–¾	1/32–3/32	4½
4280 1942	8-3⅛x4¼	.015	14B	.015	.015	A	AC	.025	7B	.020	28	7	16	110	2.00	1.24	0–N½	¼–¾	1/32–3/32	4½

NASH

SERVICE DATA



Points at which camber adjustment is made.

MAIN BEARINGS REMOVAL 1936-42

Remove oil pan. Loosen all main-bearing caps. Remove main-bearing caps, one at a time, and rotate upper half of main bearing out of place. Rotate new upper half of main bearing into place.

TRANSMISSION REMOVAL

4160=4180, 4260=4280

It is not necessary to remove the floor boards to remove the transmission on cars equipped with steering-column shift. Unbolt universal-joint flanges and remove propeller shaft. Remove speedometer drive. Disconnect the overdrive control, if car is equipped with overdrive. Remove bolts holding transmission to clutch housing and remove transmission.

4140=4240

Raise rear of car and disconnect spring U-bolts.

Disconnect hydraulic brake line and front torque-tube bolts, slide rear assembly back until universal joint separates. Remove transmission the same as 4160 and 4180 models.

AXLE SHAFT REMOVAL 1936-42

The axle shafts are held in place by the brake backing plates and the bearings are adjusted by means of shims between the backing plate and the end of rear axle main tube. Recommended axle-shaft end play is .003 in. to .006 in.

REAR AXLE REMOVAL, 1936-42, 60 AND 80 MODELS

Raise rear end of car and support the frame body. Disconnect brake cables at rear brake clevise, remove brake tubes, disconnect propeller shaft. Remove U bolt clamps holding axle to springs and remove the axle.

4140 and 4240—Disconnect the torque tube at the transmission and the rear-axle stabilizer bar at the axle. Remove brake-tube connections. Disconnect shock absorbers and springs from the rear axle permitting them to hang suspended from the body.

RING GEAR BACK LASH 1936-42

The ring gear back lash is adjusted by shims installed between the left cone and roller assembly and the differential case. When a new case or new bearings are installed, use the original shims and, when the side bearings are adjusted, the back lash should be checked with a dial indicator. This adjustment should be checked in two or three different positions to obtain an average. The correct lash is .005 in. to .007 in.

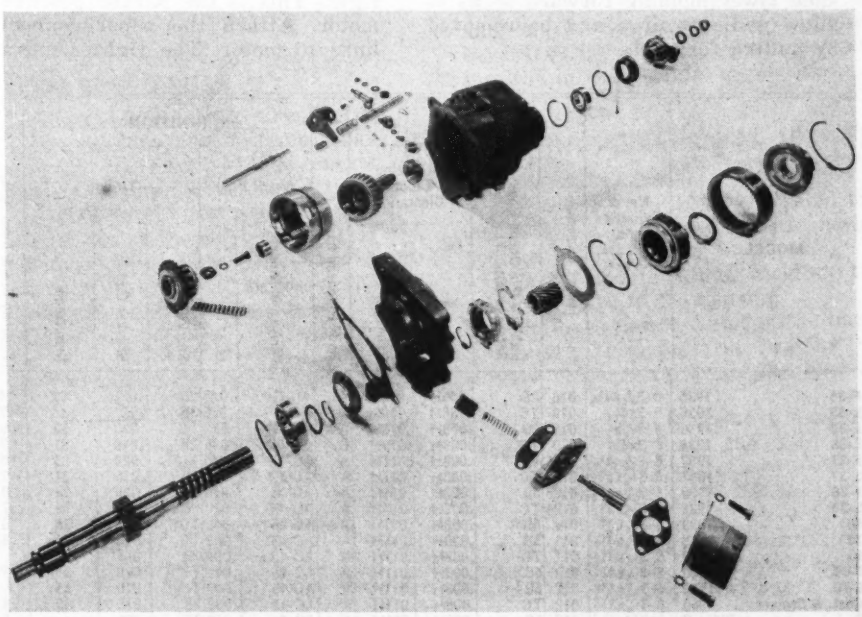
DIFFERENTIAL BEARING ADJUSTMENT 1936-42

The differential bearings are adjusted by an adjustable nut on the right side. Correct adjustment is obtained by drawing up the adjusting nut until there is no side play in the bearings and then tightening two additional notches.

When the bearing caps are removed, they should be marked to insure correct assembly. When checking for back lash, the caps should be tight and the bearings properly adjusted.

When a new drive-gear and pinion-shaft bearings or rear housing are installed, a special pinion-setting gage should be used. The pinion adjustment is controlled by washers of various thicknesses between the inner pinion-shaft bearing and the drive pinion.

If a new drive-gear set is being installed and the pinion-setting gage is not available, compare the markings on the original pinion with the markings on the new one. If the markings are the same, use the same pinion adjusting washer as was used with the original pinion. If the markings on the pinion are not the same as on the old one, it will be necessary to figure the difference and vary the thickness of the washer accordingly. If the marking on the new pinion is less than on the original pinion, add the difference, in thousandths of an inch, to the pinion-adjusting washer. If the marking on the new pinion is greater than on the original pinion, remove shims from the pinion adjusting washer, in an amount equal to the difference.



Exploded view of overdrive and solenoid used on 1940 models.

OLDSMOBILE

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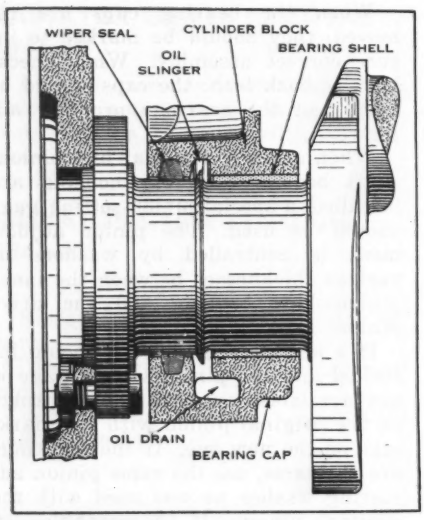


Rear main bearing oil seal, 1942 models.

RADIATOR GRILLE REMOVAL 1940-42

Disconnect the hood-lock cable. Remove four bolts on each side from grille to fenders and three self-tapping screws from center grille to side grilles. Remove six self-tapping screws from grille to lower splash shield and five self-tapping screws from grille lower molding to bumper filler plate. Lift grille up slightly and slide lower molding forward so as to allow grille to drop and be removed by pulling forward.

RADIATOR CORE REMOVAL 1939-42

Drain the radiator and disconnect the upper and lower hoses. Remove the hood-latch operating cable at the latch and draw back through the core-support flange. On six-cylinder models, remove four bolts on each side attaching the core to the lower support, and revolve the fan, as this is necessary to remove the core. On eight-cylinder models it is also necessary to remove two bolts on each side from the upper core support to fender and lower support. Rotate the upper support toward the engine, turn the fan to facilitate removal of the core.

WINDSHIELD WIPER REMOVAL 1936-42

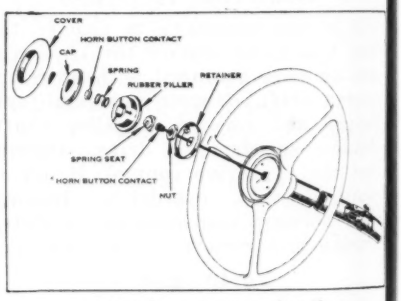
Release the coil spring and clips that retain the connecting links to the wiper-shaft arms at motor. Disconnect vacuum line from motor. Remove the machine screws holding motor to the bracket and remove motor.

Installation

Attach the wiper motor to the bracket at the underside of shroud. One end of bracket slotted for easy removal and installation of motor. Connect vacuum line. Set top end of wiper-motor shaft arm to extreme right. This is the parked position of motor. Attach the wiper connecting links to motor. The right connecting link attaches to the top arm of the wiper motor on the 60 and 70, bottom arm on 90.

MAIN BEARINGS REMOVAL 1936-42

The bearings are interchangeable without removing the crankshaft. After the bearing cap has been removed, a small specially designed pin may be inserted in the oil hole of the shaft. The head of this pin will not protrude from the hole quite as far as the thickness of the bearing. When the crankshaft is turned in the usual direction of rotation, the head of the pin will engage the upper half of the bearing and turn it out with the rotating crankshaft. The bearings may be replaced by inserting the plain edge of the bearing at the indented side of the upper bearing support and gently rotating it into place with the crank-



1938 horn button details.

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance Intake	VALVES: Operating Tappet Clearance Exhaust	Rods Removed from	IGNITION: Spark Plug Make and Model	IGNITION: Spark Plug Gap	IGNITION: Timing Spark Occurs—No. Deg.	IGNITION: Timing Breaker Gap	IGNITION: Timing Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN Diameter	CRANK-PIN Length	FRONT AXLE Caster (Degrees)	FRONT AXLE Camber (Degrees)	FRONT AXLE Toe-in (Inches)	Kingpin Inclination
F-35 1935	6–3 1/8 x 4 1/8	.010	2B	.008H	.010H	A	AC-G9	.025	2B	.021	33	6	13	99	2	1 3/8	1 1/2–2 1/4	1/8–1	1/8–1/4	5
L-35 1935	8–3x4 1/4	.010	TC	.008H	.010H	B	AC-G9	.025	3B	.021	33	7	16	103	2 1/4	1 3/8	1 1/2–2 1/4	1/8–1	1/8–1/4	5
F-36 1936	6–3 1/8 x 4 1/8	.010	2B	.008H	.010H	A	AC-G9	.033	TC	.020	35	6	13	99	2	1 3/8	1 1/2–2 1/4	1/8–1	1/8–1/4	5
L-36 1936	8–3x4 1/4	.010	TC	.008H	.010H	B	AC-G9	.030	2B	.015	31	7	16	103	2 1/4	1 3/8	1 1/2–2 1/4	1/8–1	1/8–1/4	5
F-37 1937	6–3 1/8 x 4 1/8	.0125	5B	.008H	.011H	A	AC-K9	.040	TC	.020	35	6	16	101	2 1/4	1 3/8	0–3/4 N	1/8–1	1/8–1/4	4
L-37 1937	8–3 1/4 x 3 7/8	.0125	TC	.008H	.011H	A	AC-K9	.030	2B	.015	31	7	20	103	2 1/8	1 3/8	0–3/4 N	1/8–1	1/8–1/4	4
F-38 1938	6–3 1/8 x 4 1/8	.0125	5B	.008H	.011H	A	AC-45	.040	TC	.020	35	6	17	146†	2 1/8	1 3/8	0–3/4 N	1/8–1	1/8–1/4	4
L-38 1938	8–3 1/4 x 3 7/8	.0125	TC	.008H	.011H	A	AC-45	.030	2B	.015	31	7	21	152†	2 1/8	1 3/8	0–3/4 N	1/8–1	1/8–1/4	4
60 1939	6–3 1/8 x 3 7/8	.011	5B	.008H	.011H	A	AC-45	.040	TC	.020	35	5	17	151†	2 1/8	1 3/8	0–3/4 N	1/8–1	1/8–1/4	4
70 1939	6–3 1/8 x 4 1/8	.011	5B	.008H	.011H	A	AC-45	.040	TC	.020	31	5	17	146†	2 1/8	1 3/8	0–3/4 N	1/8–1	1/8–1/4	4
80 1939	8–3 1/4 x 3 7/8	.011	TC	.008H	.011H	A	AC-45	.030	2B	.015	35	...	24	152†	2 1/8	1 3/8	0–3/4 N	1/8–1	1/8–1/4	4
6-60 1940	6–3 1/8 x 4 1/8	.012	5B	.008H	.011H	A	AC-45	.040	TC	.020	31	5	17 3/4	146†	2 1/8	1 3/8	0–N 3/4	N 1/4–+1/4	1/8–1/8	4
6-70 1940	6–3 1/8 x 4 1/8	.012	5B	.008H	.011H	A	AC-45	.040	TC	.020	35	5	17 3/4	146†	2 1/8	1 3/8	0–N 3/4	N 1/4–+1/4	1/8–1/8	4
Cust. & Cruiser 1940	8–3 1/4 x 3 7/8	.012	TC	.008H	.011H	A	AC-45	.030	2B	.015	35	6	21	152	2 1/8	1 3/8	0–N 3/4	N 1/4–+1/4	1/8–1/8	4
8 1941-42	6–3 1/8 x 4 1/8	.012	5B	.008H	.011H	A	AC-44	.040	TC	.021	.....	5	18	115*10	2 1/8	1 1/4	0–3/4 N	1/4 N–3/4 N	1/8–1/8	2
8 1941-42	8–3 1/4 x 3 7/8	.012	TC	.008H	.011H	A	AC-44	.030	2B	.015	.....	6	22*12	107*11	2 1/8	1 3/8 *23	0–3/4 N	1/4 N–3/4 N	1/8–1/8	2

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SERVICE DATA

shaft. Before installing the bearing into place, remove the sharp edge from the plain edge of the bearing. On "L" engine, it is necessary to raise front of engine to remove the upper half of front bearing.

REAR MAIN BEARING OIL SEAL 1939-42

The rear main bearing is positively sealed against oil leaks by a special asbestos-covered wiper seal; special care must be exercised in installing this seal. Whenever the crankshaft is removed, a new seal should be installed. To install the seal properly, crowd the material into the groove in the upper and lower half of the bearing by hand, drive the seal tightly into the groove by tapping three or four times with a hammer. After the seal has been seated in the bearing, cut the seal off flush with the parting line between upper and lower bearing, using a very sharp knife. The ends of the seal must be cut clean so no frayed ends will be clamped between upper and lower caps; also, the seal must entirely fill the groove and not be cut too short, otherwise a leak will occur. Main bearing bolts should be tightened evenly and with a torque wrench. Tighten as specified by the manufacturer of the wrench being used. The proper torque is 135 to 145 ft.-lb.

VALVE GUIDE REMOVAL

The same valve guide is used for both intake and exhaust and on all models. The upper end of both intake and exhaust valve guides is ⅞ in. from the top of the cylinder block. It is important when installing valve guide that the distance from the top of the guide to the top of the block be held according to specifications.

ROD AND PISTON REMOVAL 1937-42

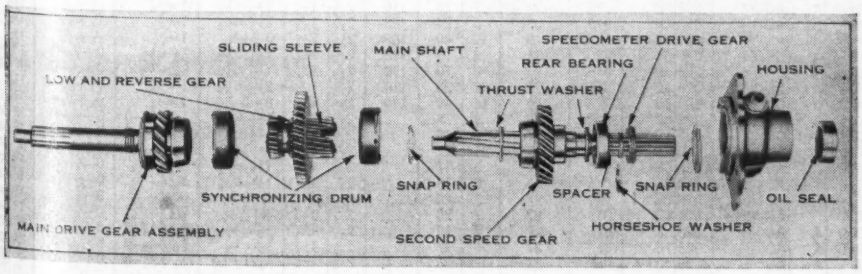
Pistons on all models must be removed from the top of the cylinder block.

PISTON CLEARANCES 1939-42

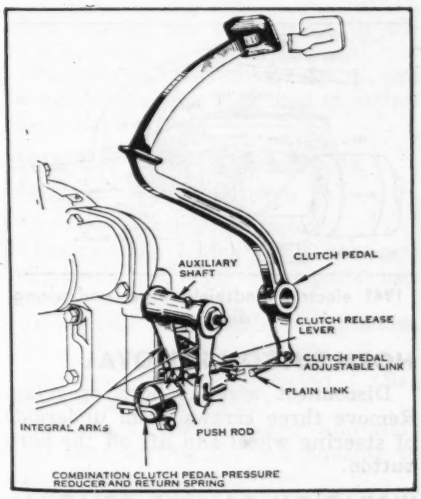
With pin removed, fit piston so that the clearance of the piston between its thrust surface and cylinder wall is .0013 in. to .0018 in. when piston and cylinder block are at normal room temperature (70 degrees). This clearance is measured by using ½-in. x 12 in. x .002-in. ribbon, which when withdrawn from between the piston and cylinder wall will read within the limits of 4 to 11 lb. The feeler ribbon should be exactly 90 degrees from piston-pin hole and in line with the thrust surface on the maximum-thrust side. If it is impossible in some cases to fit piston with piston and block at a temperature of 70 degrees, they may be fitted at higher or lower temperatures. However, when the ribbon is withdrawn from between the piston and cylinder the pounds pull required to remove ribbon should be as follows: For temperatures lower than 70 degrees, using the same size ribbon, favor the low pounds pull. For temperatures above 70 degrees, using the same size ribbon, favor the high pounds pull. This compensates for the expansion and contraction of the piston.

LOW SPEED MISS

One point to check when trying to locate a low-speed engine miss, or uneven operation of the engine, is loose fuel-pump cover screws on both the fuel-pump side and the vacuum-pump side of the combination fuel and vacuum-pump unit. Loose cover-attaching screws will cause a vacuum leak and result in a low-speed miss or uneven operation of the engine.



Transmission main drive shaft, 1938 to 1942 models.



Clutch throwout auxiliary shaft assembly, 1937 models.

ACCELERATOR PUMP 1941-42

Poor acceleration on 1942 Oldsmobile cars may be attributed to improper setting of the carburetor accelerator pump stroke.

This adjustment can be checked by marking the pump shaft at wide-open position and the fully closed position and gaging the distance between the markings. The full stroke on all the eight-cylinder cars is 19/64 in., on the Hydra-matic six-cylinder car 5/16 in. and on the Syncro-mesh six-cylinder car 15/16 in. with the pump connecting link in the medium stroke hole.

AXLE SHAFT REMOVAL 1936-42

Take off the wheel.

Remove the two bolts that hold the brake drum to the axle shaft flange and remove the drum.

Remove the four nuts holding the backing plate to the housing.

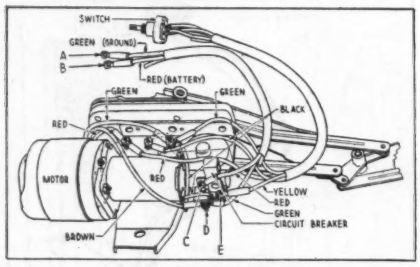
Take care not to dislodge the backing plate, then pull the bearing retainer plate away from the backing plate.

Use a puller to remove the axle shaft. Do not drag the axle shaft over the oil seals as damage to the oil seals will result and will cause a grease leak.

When replacing the oil seals make sure they are driven into the housing true with the axis of the shaft. Apply a sealing compound to the outside diameter of the seals.

PACKARD

SERVICE DATA



1941 electric windshield wiper and wiring diagram.

HORN BUTTON REMOVAL

Disconnect wire at horn or relay. Remove three screws from underside of steering wheel and lift off the horn button.

VIBRATION DAMPER REMOVAL 1936-42

Remove the front-end sheet-metal assembly as a unit. Use a puller to remove the vibration damper.

MAIN BEARINGS REMOVAL 1936-42

The main bearings may be removed from below without removing the crankshaft. They are shimless, steel-backed, babbitt-lined.

PISTON INSTALLATION

All Sixes and Eights

The piston and connecting-rod assemblies are removed from the top of the block. When re-installing, make certain that the oil squirt holes and piston slots are on the camshaft side of the engine.

PISTON CLEARANCES 1936-42

The pistons are cam-ground and tin-plated. Correct piston fit is .0015 in., measured with a feeler blade ½ in. wide inserted between the bore and the non-slotted face of the piston. A pull on the gage of 12 to 18 lb. upward should be required.

PISTON PIN INSTALLATION 1936-42

Before removing rods from pistons, the pistons should be heated to 160 degrees F. so as not to injure the piston bosses. The piston pins should be a finger-push fit in the piston when it is heated to 160 degrees and a similar fit in the rods at room temperature.

PISTON MARKING CODE

Pistons are supplied in standard and also in nominal oversizes of .005, .010, .020, .030 and .040 in.

Within each standard and oversize, there are diameter variations indicated by alphabetical markings on the piston head which are in addition to the oversize stamped thereon in numerals. Code for the alphabetical markings is tabulated below:

A-A—.00025 in. under the marked size

A—Same as the marked size.

B-B—.00025 in. over the marked size

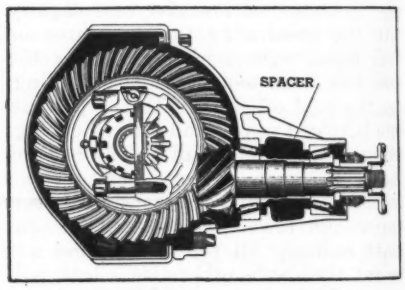
B—.00050 in. over the marked size

C-C—.00075 in. over the marked size

C—.001 in. over the marked size

D-D—.00125 in. over the marked size

D—.00150 in. over the marked size



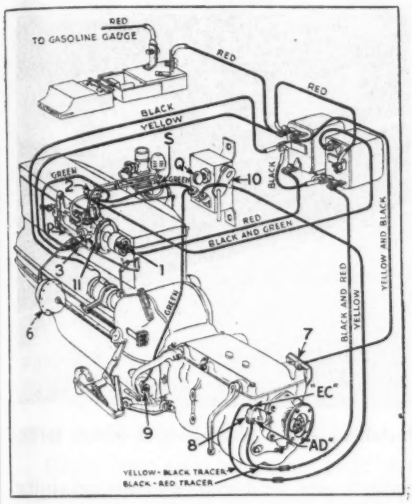
1939 differential carrier assembly.

MODEL		No. of Cylinders and Bore and Stroke	VALVES				Rods Removed from	IGNITION					Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN		FRONT AXLE			
					Operating Tappet Clearance			Spark Plug		Timing												
			Inlet Tappet Clearance for Valve Timing	Intake Valve Opens Deg. Before or After TC	Intake	Exhaust		Make and Model	Gap	Spark Occurs—No. Deg.	Breaker Gap	Cam Angle				Diameter	Length	Caster (Degrees)	Camber (Degrees)	Toe-in (Inches)	Kingpin Inclination (Degrees)
120B	1936	8-3¼x4¼	.006	2¾B	.007H	.010H	A	CA-J8-K7	.029	7B	.020	32	7	18	110	2⅜	1⅜	2	1	1/16-1/8	1½
1400, 1, 2	1936	8-3⅜x5	.004	10B	.004H	.006H	(r)	CA-J8-K7	.029	6B	.020	33	8	20	110	2⅜	1⅜	1	1	0-1/16	9
1403, 4, 5-Super 8	1936	8-2½x5	.004	10B	.004H	.006H	A	CA-J8-K7	.029	6B	.020	33	9½	22	110	2⅜	1¼	1	1	0-1/16	9
1407, 8-V12	1936	12-3 7/16x4¼	.000	TC	AA	AA	(r)	CA-J8-K7	.029	8B	.020	40	10	40	110	2½	2¼	1	1	0-1/16	9
115C	1937	6-3 1/16x4¼	.....	5B	.007H	.010H	A	AC-Y4°	.028	4B	.015	38[1]	7	17	105	2⅜	1¼	2½±½	1±¼	1/16±1/16	1½
120C	1937	8-3¼x4¼	.....	5B	.007H	.010H	A	AC-Y4°	.028	7B	.015	27	7	20	110	2⅜	1¼	2½±½	1±¼	1/16±1/16	1½
1500, 1, 2-Super 8	1937	8-3⅜x5	.....	30B	.004H	.006H	(r)	AC-Y4°	.028	6B	.015	27[1]	8	24	108	2⅜	1⅜	2½±½	1±¼	1/16±1/16	1½
1506, 7, 8-V12	1937	12-3 7/16x4¼	.000	TC	AA	AA	(r)	AC-Y4°	.028	6B	.020	40	10	40	108	2½	2¼	0-½N	1±¼	1/16±1/16	1½
1600	1938	6-3 1/16x4¼	.....	1B	.007H	.010H	A	Ch-Y4°	.028	6B	.020	31	6	15	110	2⅜	1¼	1½±½	½±½	0+1/16-0	1° 54'
1601, 2	1938	8-3¼x4¼	.....	1B	.007H	.010H	A	Ch-Y4°	.028	8B	.015	27	6	16	110	2⅜	1¼	1½±½	½±½	0+1/16-0	1° 54'
1603, 4, 5-Super 8	1938	8-3⅜x5	.....	30B	.006H	.008H	(r)	Ch-Y4°	.028	6B	.015	27	8	20	110	2⅜	1⅜	2½±½	1±¼	1/16+1/16-0	1½
1607, 8; 1706, 7, 8	1938-39	12-3 7/16x4¼	.....	TC	AA	AA	(r)	Ch-Y4°	.028	6B	.020	40	10	40	110	2½	1⅝	0+0-½	1±¼	1/16+1/16-0	1½
1700	1939	6-3 1/16x4¼	.0125	1B	.007H	.010H	A	Ch-Y4°	.028	6B	.020	38	5	15.2	.....	2⅜	1¼	1½±½	½+¼-0	0+1/16-0	1° 54'
1701, 2	1939	8-3¼x4¼	.0125	1B	.007H	.010H	....	Ch-Y4°	.028	8B	.015	27	6	16	.....	2⅜	1¼	1½±½	½+¼-0	0+1/16-0	1° 54'
1703, 5	1939	8-3 1/16x5	.005	26B	.006H	.008H	....	Ch-Y4°	.028	7B	.015	27	7½	22	.....	2⅜	1⅜	0±½	½+¼-0	0+1/16-0	1° 54'
1800, 6	1940	6-3 1/16x4¼	.012	1B	.007H	.010H	....	AC-1042	.028	6B	.020	35	5	17	.....	2⅜	1¼	1½±½	N½+¼	0-1/16	1° 54'
1801, 8	1940	8-3¼x4¼	.012	1B	.007H	.010H	....	AC-1042	.028	8B	.015	41	6	18	.....	2⅜	1¼	1½±½	N½+¼	0-1/16	1° 54'
1803, 4, 5; Sup. 8	1940	8-3 1/16x4 5/8	AA	4B	AA	AA	....	AC-1042	.028	5B	.015	27	7	20	.....	2¼	1⅜	N1±½	N½+¼	0-1/16	1° 54'
1806, 7, 8; Cus.Sup. 8	1940	8-3 1/16x4 5/8	AA	4B	AA	AA	....	AC-1042	.028	5B	.015	27	7	20	.....	2¼	1⅜	N1±½	N½+¼	0-1/16	1° 54'
6	1941-42	6-3 1/16x4¼	.012	1B	.007H	.010H	A	AC*13	.028	6B*14	.020	27	5	15	.....	2⅜	1¼	½±½	½+¾-0	0+1/16-0	2° 30'*18
8	1941-42	8-3¼x4¼	.012	1B	.007H	.010H	A	AC*13	.028	7B*14	.017	27	6	17	.....	2⅜	1¼	½±½	½+¾-0	0+1/16-0	2° 30'*18
Super 8	1941-42	8-3 1/16x4 5/8	HA	4B	HA	HA	A	AC*13	.028	5B*14	.017*15	27	7	20	.....	2¼	1⅜	¾N±½	½+¾-0	0+1/16-0	2° 30'*18

[1] For Autolite Distributors.

PACKARD

SERVICE DATA



Electromatic clutch wiring diagram, 1942 models.

ADJUSTMENT OF STEERING COLUMN GEARSHIFT

1939-40—The linkage can be adjusted by inserting a 3/16 in. aligning pin or a drill rod through the aligning holes of both the column shaft levers. Set the hand-control lever and the levers on the transmission in neutral and disconnect the upper and lower control rods. Adjust the length of the rods until they slip into place in their levers at the transmission without moving any of the levers from neutral position.

1941-42—All adjustments are the same as 1940 models, except that a rubber button is used at the lower end of the steering column jacket to act as a stop for the high-gear shift. To make the adjustment for the high-gear stop, place the hand-control lever in high-gear position and loosen the lock nut which holds the rubber button in place. Then turn the adjustment until the rubber button is compressed ⅛ in. and tighten the lock nut.

WATER PUMP OVERHAUL 1936-42

Remove the fan blades and pulley. Press the impeller off the shaft. To avoid breaking the pump body when pressing the impeller off the shaft, it should be supported. The machined face on the pump body against which the washer rides must be smooth and flat. After renewing the synthetic rubber seal and the composition thrust washer, installation of the impeller will be facilitated by heating the impeller in water and coating the shaft and seal with machine oil.

HYDRAULIC VALVE LIFTER OVERHAUL

Series 1903-1904-1905

It is important to note that each hydraulic-lifter assembly is matched fit when assembled at the factory and, if for any reason they are taken apart, the cylinder and plunger should be marked to facilitate identification. Before attempting to grind valves the hydraulic lifters must be removed. After grinding the valves, it may be necessary to run the engine for one hour to fill the units completely with oil. If tappet noises still continue after running, look for a lack of oil supply or it may be that the units have been dis rranged.

To check a noisy unit, examine the plunger and cylinder for score marks.

The check ball and seat must be clean and the ball must move freely.

To test the fit of the plunger in the cylinder, release the spring from the cylinder, lift the plunger and push it into the cylinder quickly and release. If it does not tend to return, renew the unit.

To remove mushroom tappets, it is necessary to remove the camshaft.

AXLE SHAFT REMOVAL 1936-42

Remove the wheel.

Unbolt the backing plate and the clips holding the brake tube to the axle housing.

End play of less than .050 in. can be adjusted at one side only to obtain the desired .006 in.

CLUTCH REMOVAL 1936-42

Sixes and 120's

Remove the transmission.

Remove the clutch-throwout bearing, pedal rod and cover-plate cap screws.

Withdraw the assembly from below.

Series 1903-1904-1905

Remove the transmission. (See Transmission Removal.)

Remove the four screws and four stud nuts holding the bell housing to the engine.

Remove the bell housing and unbolt the clutch from the flywheel and remove rearward.

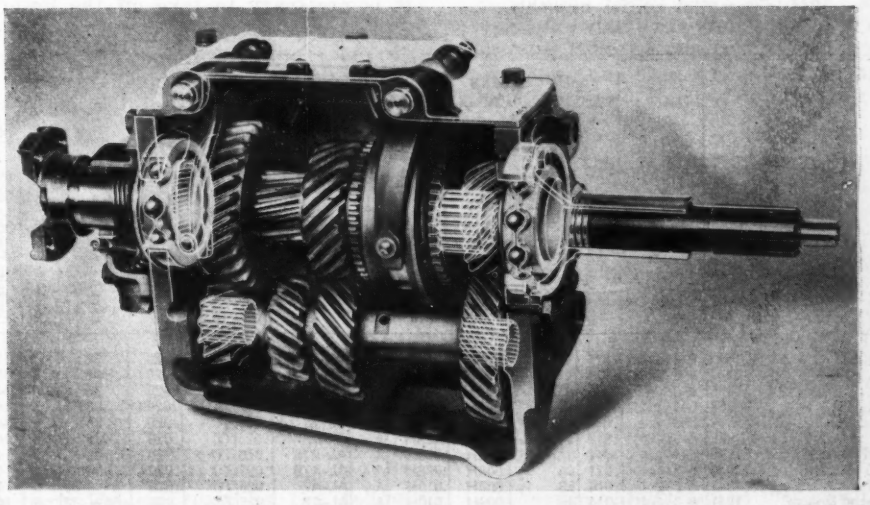
Disconnect the propeller shaft at the front end and block it up against the floor pan.

Disconnect the two shifter-control rods, overdrive control cable if so equipped, hand-brake lever cable at equalizer, and the rubber bearing at the rear of the overdrive unit.

Support the rear of the engine with a jack, then unbolt the cross member from the frame and the flywheel-housing cover.

Disconnect the clutch retractor spring, fore and aft restraint rod and remove the cap screws holding the unit to the bell housing.

Remove the transmission and overdrive unit.



1940 Model 160 and 180 transmission.

PLYMOUTH

SERVICE DATA

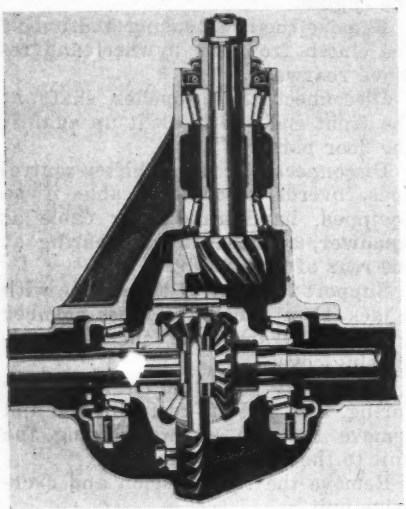
HORN BUTTON REMOVAL

Model, P11, 1941-42

Disconnect the horn wire at the connector between the bottom of the steering gear and the horn. Remove the screws from the underside of the steering-wheel hub and lift off the horn-button retainer and horn button. The wire can now be pulled up out of the steering tube.

Model P12 & P14

The horn-blowing ring and wire may be removed from the steering gear as follows: Disconnect the horn wire at the connector between the bottom of the steering gear and the horn. Remove the screws from the underside of the steering-wheel hub and lift off the horn-blowing ring and retainer. Remove the screws which hold the contact plate and spring to the wheel hub. Pull the wire out of the steering tube. The terminal of the wire is pressed into the contact plate and is removed by pushing it out of the plate.



1941 differential carrier assembly.

WINDSHIELD WIPER REMOVAL 1939-42

Remove windshield-wiper blades and arms. Disconnect the links at the wiper motor. Remove screws holding transmissions to cowl and remove transmissions. Disconnect vacuum line and remove two screws from wiper motor and lift out the motor.

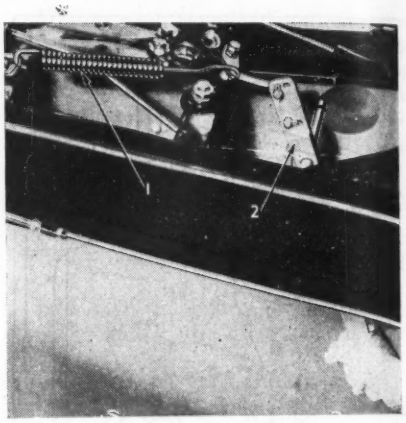
GAS TANK REMOVAL 1936-42

Remove filler cap and nuts holding tank. Disconnect gas line and gage wire. Lower tank.

RADIATOR GRILLE REMOVAL 1941-42

To take off the radiator grille panel, remove the hood-lock lower plate, lower splash pan and bolts from fender to panel and hood side-panel to radiator panel.

The grille trim bars are held on with clips. They can be removed by pulling them off from the outside. To remove the molding around the grille, it is necessary to take off the lower splash pan and remove the retaining nuts.



Installing clutch release over-center spring.

RADIATOR CORE REMOVAL 1936-42

Drain the cooling system. Remove the upper and lower hose connections. Unclip and move out of the way the headlight wires. Remove the upper brackets at the right and left corners of the radiator support and the screws on each side of the radiator support. Lift out the radiator core. To install the core, reverse the above procedure.

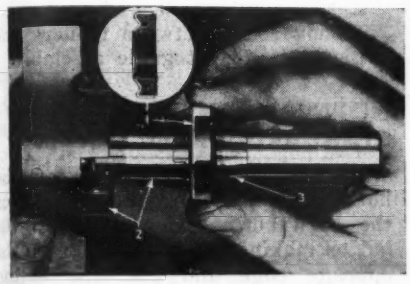
GAS TANK GAGE REMOVAL 1936-42

Raise the mat in the rear of the car and remove the cover over gas tank gage. Remove screws holding gage

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance: Intake	VALVES: Operating Tappet Clearance: Exhaust	Rods Removed from	IGNITION: Spark Plug: Make and Model	IGNITION: Spark Plug: Gap	IGNITION: Timing: Spark Occurs—No. Deg.	IGNITION: Timing: Breaker Gap	IGNITION: Timing: Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN: Diameter	CRANK-PIN: Length	FRONT AXLE: Caster (Degrees)	FRONT AXLE: Camber (Degrees)	FRONT AXLE: Toe-in (Inches)	FRONT AXLE: Kingpin Inclination (Degrees)
P1, P2.....1936	6-3 1/16x4 3/8	.011	VDM	.006H	.008H	A	AC-K9	.025	4A	.020	38	5	15	114	1 1/16	1	1-3	1/4-3/4	0-1/8	9 1/2
P3, P4.....1937	6-3 1/16x4 3/8	.011	VDM	.006H	.008H	A	Ch-J8	.025	4A	.020	38	5	15	114	1 1/16	1	1-3	1/4-3/4	0-1/8	4 1/2-8 1/2
P5.....1938	6-3 1/16x4 3/8	.011	VDM	.006H	.008H	A	Ch-J8	.025	4A	.020	38	5	14	145†	1 1/16	1	3-5	1/4-3/4	0-1/8	4 1/2-8 1/2
P6.....1938	6-3 1/16x4 3/8	.011	VDM	.006H	.008H	A	A-A7	.025	4A	.020	38	5	14	145†	1 1/16	1	1-3	1/4-3/4	0-1/8	4 1/2-8 1/2
P7.....1939	6-3 1/16x4 3/8	.011	VDM	.006H	.008H	A	Ch-J8	.025	TC	.020	38	5	14	145†	1 1/16	1	1/2N-1 1/2P	1/4N-1 1/2P	0-1/8	5 1/2-8 1/2
P8.....1939	6-3 1/16x4 3/8	.011	VDM	.006H	.008H	A	A-A7	.025	TC	.020	38	5	14	145†	1 1/16	1	1/2N-1 1/2P	1/4N-1 1/2P	0-1/8	5 1/2-8 1/2
P9 Roadking.....1940	6-3 1/16x4 3/8	.011	6A	.006H	.008H	A	AL-A7B	.025	TC	.020	38	5	14	150†	1 1/16	1	N1-+1	0-3/4	0-1/8	4 3/4-6
P10 DeLuxe.....1940	6-3 1/16x4 3/8	.011	6A	.006H	.008H	A	AL-A7B	.025	TC	.020	38	5	14	150†	1 1/16	1	N1-+1	0-3/4	0-1/8	4 3/4-6
P11.....1941	6-3 1/16x4 3/8	.014	9B	.008H	.010H	A	AL-A7	.025	TC	.020	34 1/2-38	5	14	.....	1 1/16	1	1N-1P	0-3/4P	0-1/8	4 3/4-6
Special Deluxe.....1941	6-3 1/16x4 3/8	.014	9B	.008H	.010H	A	AL-A7	.025	TC	.020	34 1/2-38	5	14	.....	1 1/16	1	1N-1P	0-3/4P	0-1/8	4 3/4-6
P14.....1942	6-3 1/4x4 3/8	.014	12B	.008H	.010H	A	AL-47	.025	3B	.020	34 1/2-38	5	15	125	2 1/16	1	1N-1P	0-3/4P	0-1/16	4 3/4-6

PLYMOUTH

SERVICE DATA



Installing water pump seal, using special tool.

unit in tank, disconnect wires and lift unit out of tank.

OIL PAN REMOVAL 1936-42

Drain oil and reinsert plug and tighten securely. Remove clutch-housing pan to prevent damaging the oil-pan gaskets on the clutch-housing-pan dust seal. Remove the oil-level indicator, and drop the pan on the tie rod. Lift the oil strainer so it clears the baffle inside the pan and slide the pan toward the rear.

Before installing, clean the pan and replace all gaskets. The end gaskets should be allowed to protrude ¼ to ⅛ in. above the oil pan so that during tightening they will be compressed, thus forming a good seal.

MAIN BEARINGS REMOVAL 1939-42

Remove the oil pan, clutch-housing pan and oil-pump strainer. Take off the crankshaft-pulley splash shield. Remove the two longer screws from the timing-chain-case cover to the oil-pan front-end oil seal plate and remove the oil-seal plate. Loosen the bearing caps and remove one bearing shell at a time. By inserting a special tool in the oil hole of the crankshaft and rotating the crankshaft clockwise, the upper shell may be removed.

Before replacing new shells remove the sharp edge from the plain side of the bearing by slightly chamfering. Use tool inserted into crankshaft oil hole to turn new shell into place by rotating the crankshaft counter-clockwise. Install the lower half of the bearing by drawing down evenly on the nuts or cap screws. Tighten nuts to 75 to 80 ft.-lb. and cap screws to 80 to 85 ft.-lb.

PISTON CLEARANCES 1936-42

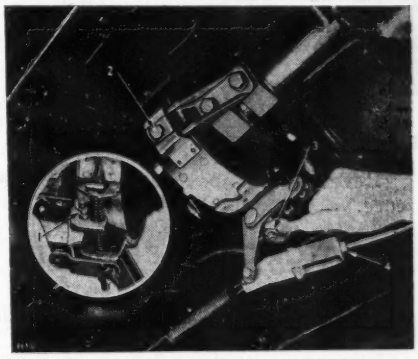
With piston pin removed, cylinder wall and piston dry and clean, fit piston so there is .0001 in. to .0011 in. clearance between the bottom of the piston and cylinder wall at normal room temperature (70 degrees F.).

CONNECTING ROD INSTALLATION 1936-42

The connecting rods should be installed with the oil-metering hole toward the valve side of the engine. Assemblies are removed through the top of the cylinder block.

FLYWHEEL REMOVAL 1936-42

Remove the clutch disc. See Clutch Removal paragraph. Remove the oil pan and the rear main-bearing cap. Remove the flywheel nuts and the two lower bolts, allowing the flywheel to



Hand brake adjustment (all models).

be turned so that the two upper bolts are at the bottom. Remove the flywheel. After installing the flywheel, check the runout. It should not exceed .003 in. Tighten the flywheel bolts 55 to 60 ft.-lb.

VALVE GUIDES REMOVAL 1936-42

Insert valve guide, removing and installing tool through guide and screw nut on extension screws. Turn the screw handle to the left and the guide will move up and out.

The distance from the top of the valve guide to the top face of the cylinder block is ⅞ in. Clearance for valve stems in guides is: inlet .001 to .003 in.; exhaust .003 to .005 in.

Excessive clearance will necessitate replacing the guides. When installing new guides, ream to the following specifications: inlet .342 to .343 in., and exhaust .344 to .345 in.

VALVE TIMING 1941-42

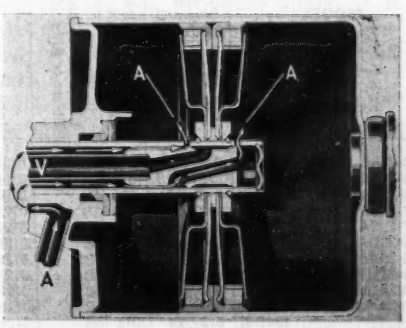
1941 Models: First 20,000 cars. With intake and exhaust-valve tappets set to .014 in., intake valve open closes 6 degrees or 6 divisions on fan-drive pulley or .060 in. piston travel before top center. Exhaust valve closes 6 degrees or 6 divisions on fan drive pulley or .015 in. piston travel after top center. 1941 models: After first 20,000 miles. With intake and exhaust tappets set to .014 in., intake valve opens 9 degrees or 9 divisions on fan-drive pulley or .034 in. piston travel before top center. Exhaust valve closes 9 degrees or 9 divisions on fan-drive pulley or .034 in. piston travel after top center. 1942 models: With intake and exhaust valve tappets set to .014 in., intake valve opens 12 degrees before top center and exhaust valve closes 6 degrees after top center.

CLUTCH REMOVAL 1936-42

Remove the clutch release fork pull-back spring. Remove clutch-housing pan. Disconnect the release fork from the pivot and pull the fork out as far as it will go. Mark clutch cover and flywheel and remove bolts which hold the clutch cover to the flywheel, loosening each bolt a few turns until the cover is loose.

AXLE SHAFT REMOVAL 1936-42

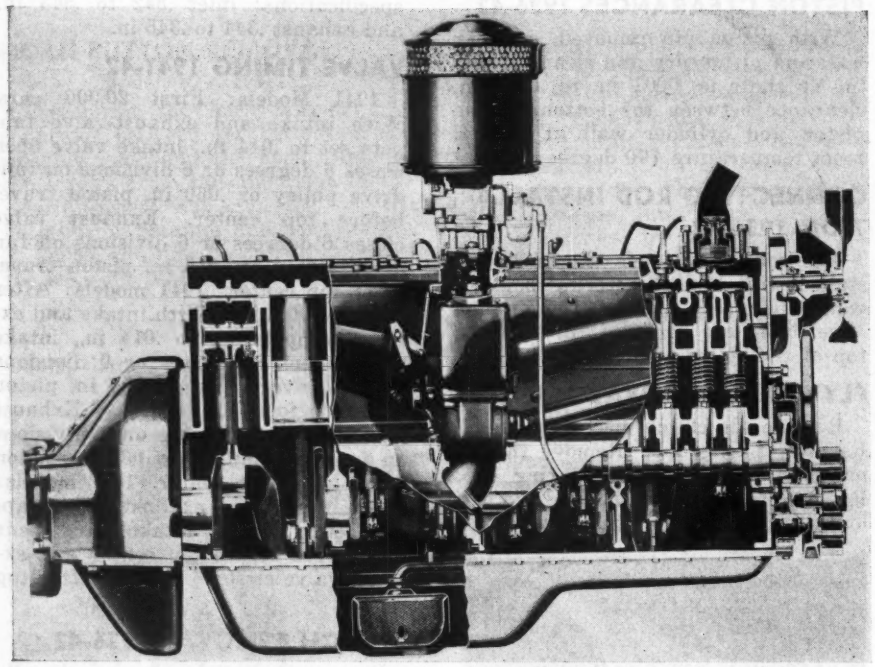
Remove the wheel and axle-shaft cotter pin and nut. Remove hub and brake-drum assembly. Disconnect brake line from wheel cylinder. Remove the stud nuts which hold the oil seal and brake support to the axle housing, and remove oil seals and brake support. Remove axle shaft and bearing.



Vacuum cylinder used on 1942 clutch.

PONTIAC

SERVICE DATA



Sectional view of 1938 8-cylinder engine.

RADIATOR CORE REMOVAL 1940-42

Drain the cooling system and disconnect the upper and lower hoses. Remove three cap screws on each side of the core and tip the fan shroud back against the engine. Lift the core up and out of the shell, revolving the fan as necessary to clear the lower connection.

Reverse the above to replace the core.

RADIATOR GRILLE REMOVAL 1941-42

Raise hood and remove hood-catch lower plate.

Disconnect parking lamps at junction block.

Remove bumber apron.

Remove bolts between fenders and grille and lift out grille assembly.

HORN BUTTON REMOVAL STANDARD WHEEL 1936-42

Disconnect the horn wire from the horn. Press down on the outer edge of the horn button which will tip the button making it possible to grasp the opposite edge and pull the button assembly from the retainer cup.

GAS TANK REMOVAL 1936-42

Drain the tank and disconnect the gage wire and the fuel line.

Disconnect the support straps at the rear, allowing them to drop forward.

Lowr the tank sufficiently to permit disengaging the filler pipe from the hole in the fender, by dropping the tank toward the front until it is free to remove.

To install reverse the above procedure.

OIL PAN REMOVAL 1941-42

The oil pan on six cylinder models is removed in the conventional way.

To remove the oil pan on the eight cylinder engine, take out the front cross member to radiator support aprons so as to obtain access to the attaching screws at the front end of the pan. Remove the right and left sheet metal apron attaching screws and lift out with a circular motion—right to right and left to left.

MODEL	No. of Cylinders and Bore and Stroke	VALVES				Rods Removed from	IGNITION					Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN		FRONT AXLE			
		Inlet Tappet Clearance for Valve Timing	Intake Valve Opens Deg. Before or After TC	Operating Tappet Clearance			Spark Plug		Timing						Diameter	Length	Caster (Degrees)	Camber (Degrees)	Toe-in (Inches)	Kingpin Inclination (Degrees)
				Intake	Exhaust		Make and Model	Gap	Spark Occurs—No. Deg.	Breaker Gap	Cam Angle									
36-26BB-Master 6...1936	6–3⅜x3⅞	.010	2B	.010H	.010H	A	AC-K7	.025	4B	.020	35	6	15	103	2	1 1/16	0–1½	1¼–1¾	0–⅛	7
36-26BA-DeLuxe 6...1936	6–3⅜x3⅞	.010	2B	.010H	.010H	A	AC-K7	.025	4B	.020	35	6	15	103	2	1 1/16	0	0–¼	0–1/16	8¾
36-28BA-Eight.....1936	8–3¼x3½	.010	2B	.010H	.010H	A	AC-K7	.025	4B	.018	31	7	16¾	103	2	1 1/16	0	0–¼	0–1/16	8¾
37-26CA.....1937	6–3 1/16x4	.015	5B	.012H	.012H	A	AC-K7	.025	4B	.019	35	6	16	103	2	1 1/16	⅜N–1¼N	¾–1¼	0	4½–5
37-28CA.....1937	8–3¼x3¾	.015	5B	.012H	.012H	A	AC-K7	.025	4B	.016	31	7	19	103	2	1 1/16	⅜N–1¼N	¾–1¼	0–1/16	4½–5
38-26DA.....1938	6–3 1/16x4	.015	5B	.012H	.012H	A	AC-45	.025	4B	.020	35	6	16	141†	2	1 1/16	⅜N–1¼N	¾–1¼	0	4° 51′
38-28DA, 39-28...1938-39	8–3¼x3¾	.015	5B	.012H	.012H	A	AC-45	.025	4B	.015	31	7	19	141†	2	1 1/16	⅜N–1¼N	¾–1¼	0–1/16	4° 51′
39-25, 39-26.....1939	6–3 1/16x4	.015	5B	.012H	.012H	A	AC-45	.025	4B	.021	35	6	17	141†	2 1/16	1 3/32	⅛N–1N	½–1	0–1/16	4° 51′
40-25, 26.....1940	6–3 1/16x4	.015	5B	.012H	.012H	A	AC-45	.025	4B	.020	35	6	17	156†	2 1/8	1 3/32	N⅛–N1	⅛–⅝	0–1/16	4° 51′
40-28, 29.....1940	8–3¼x3¾	.015	5B	.012H	.012H	A	AC-45	.025	4B	.015	31	6	19	152†	2	1 1/16	N⅛–N1	⅛–⅝	0–1/16	4° 51′
6.....1941-42	6–3 1/16x4	.015	5B	.012H	.012H	A	AC-45	.025	4B	.021	37	6	18	.....	2 1/16	1 3/32	¼N–1N	0–1	0–1/16	4½–5
8.....1941-42	8–3¼x3¾	.015	5B	.012H	.012H	A	AC-45	.025	4B	.015	31	6	19½	.....	2	1 1/16	⅛N–1N	0	0–1/16	4⅝

PONTIAC

SERVICE DATA

PISTON CLEARANCES

The piston should fit so that a ½ in. x .0015 in. feeler ribbon can be withdrawn from between the piston and cylinder wall with a 10 to 20 lb. pull. The cylinder bores should be held within .0005 in. out-of-round or taper.

PISTON PIN INSTALLATION

The piston pins are case-hardened, ground and held to within a maximum out-of-round of .0002 in. The piston bosses should first be coated with graphite grease and a pressure of from 200 to 300 lb. is recommended for pressing the pins into the bosses. The pin should be assembled in the piston with the slotted end entering first into the lock boss.

VALVE GUIDE REMOVAL 1936-42

Tapered, removable, valve guides are used in all models. The upper end is slightly larger than the lower end which permits a closer fit at the bottom of the valve guide where less clearance is desirable and at the same time provides sufficient clearance at the upper end of the valve guide to allow for the expansion of the parts.

The valve guides taper .001 in. and the valves should be installed to give from a free fit to .0006 in.

HARMONIC BALANCER REMOVAL 1936-42

Remove radiator assembly and use puller to remove balancer.

MAIN BEARINGS REMOVAL 1936-42

The main bearings are the replacable steel-backed type. The upper and lower halves are interchangeable. The main bearings can be removed without removing the crankshaft.

A suitable bearing-removing tool can be made from a ⅛ in. x 1½ in. cotter pin. By placing this tool in the hole of the crankshaft and rotating the shaft in its usual direction the bearing will be removed.

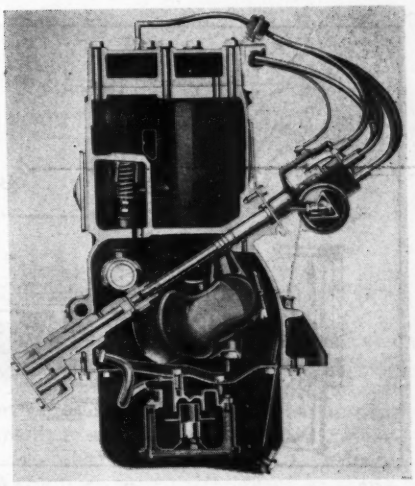
CLUTCH REMOVAL 1936-42

Remove the clutch housing bottom cover and control shaft inner bracket, Unlock the clutch pedal pull back spring. Remove the clutch fork ball support, clutch fork and clutch throwout bearing.

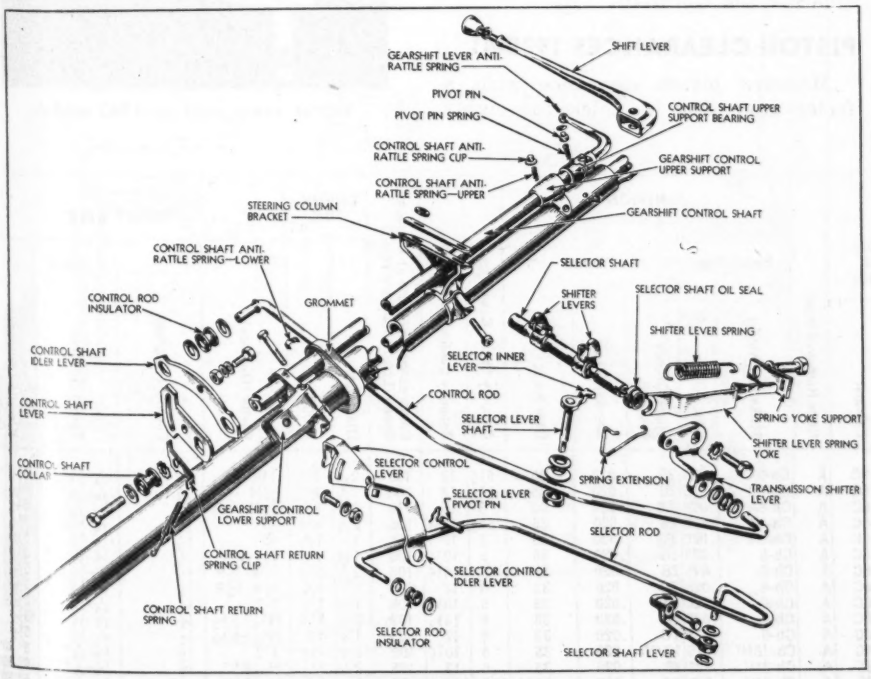
It will be nessary to mark the flywheel and clutch cover with paint before removing the clutch cover, because there is no locating pin in the flyweel to relocate the cover assembly when installing.

Remove the bolts holding the cover to the flywheel by loosening them one turn at a time until the tension is relieved. Move the clutch assembly away from the flywheel at the bottom which will permit removal of the clutch plate and facings. Lower the assembly through the bottom of the clutch housing.

To reassemble reverse the above procedure.



Section through 1940 oil pump and distributor driver.



1941 steering column gearshift details.

TRANSMISSION REMOVAL 1936-42

Disconnect the speedometer cable, gear-shift selector rod and control rod from the transmission.

Disconnect the rear universal joint and remove the propeller shaft. It is advisable to use a rubber band to prevent the trunnions from slipping off the universal-joint spider.

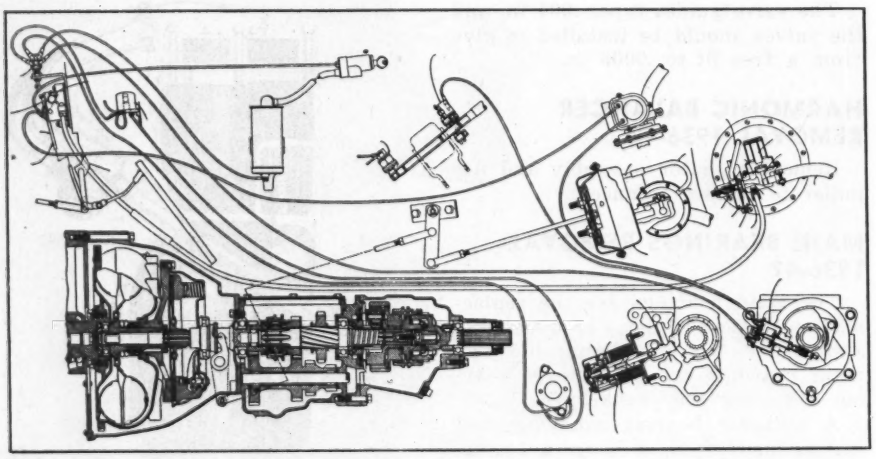
Remove the transmission upper fastening cap screw and install guide pins. These pins may be made by cutting the heads off two cap screws and sawing a slot in the ends. Remove the other cap screws.

Pull the transmission backward until the main drive gear is free then lower to the floor.

Reverse the above to replace the assembly.

STUDEBAKER

SERVICE DATA



Details of 1942 Turbo-matic drive.

WINDSHIELD WIPER REMOVAL 1941-42

Disconnect one battery terminal and remove driver rod lock. Remove both driver rods at wiper motor. Disconnect three cables at wiper motor and remove two screws and nuts holding motor to cowl.

RADIATOR CORE REMOVAL 1937-42

Drain cooling system. Tie up hood. Remove hood side panels, and disconnect hood lock rod. Remove headlamp harness out of clips, and remove core to shell screws. Loosen one end of both hose connections and remove radiator core.

PISTON INSTALLATION

1942—First type: Install pistons with piston pattern number toward front of engine. Second type: Install pistons with raised boss inside skirt toward camshaft side of engine.

1941—Install pistons with T-slot opposite the camshaft.

PISTON CLEARANCES 1935-41

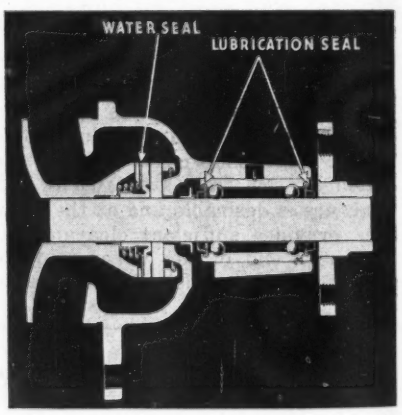
Measure piston clearance with a feeler gage .003 in. thick for eights and .002 in. for sixes and 1 in. wide. A pull of 10 to 15 lb. should be required to move the feeler gage.

CONNECTING ROD INSTALLATION

The oil hole in the lower end of the rod should be toward the camshaft side of the engine. The rod bearings are of the interchangeable type, steel-backed, with a lead-bronze lining. They are obtainable in standard size and .005, .010 and .020 in. undersize.

MAIN BEARINGS REMOVAL 1935-42

Main bearings are the slip-in type, renewable from below. Remove one cap at a time and insert a nail or a



Water pump used on 1940 models.

MODEL	No. of Cylinders and Bore and Stroke	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Deg. Before or After TC	VALVES: Operating Tappet Clearance: Intake	VALVES: Operating Tappet Clearance: Exhaust	Rods Removed from	IGNITION: Spark Plug: Make and Model	IGNITION: Spark Plug: Gap	IGNITION: Timing: Spark Occurs—No. Deg.	IGNITION: Timing: Breaker Gap	IGNITION: Timing: Cam Angle	Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN: Diameter	CRANK-PIN: Length	FRONT AXLE: Caster (Degrees)	FRONT AXLE: Camber (Degrees)	FRONT AXLE: Toe-in (Inches)	FRONT AXLE: Kingpin Inclination (Degrees)
5A-Dictator.....1937	6-3 1/4x4 3/8	.020	15B	.016C	.016C	A	Ch-8A	.025	2B	.020	35	5 1/2	13	105	2 1/16	1 3/8	1 1/2	1/2	1/16-1/8	5 1/2
6A-Dictator Pl.....1937	6-3 1/4x4 3/8	.020	15B	.016C	.016C	A	Ch-8A	.025	2B	.020	35	5 1/2	13	105	2 1/16	1 3/8	1/4N-1/2P	1/2	1/16-1/8	5 1/2
3C-President.....1937	8-3 1/16x4 1/4	.020	15B	.016C	.016C	A	Ch-8A	.025	TC	.020	33	8	16	110	1 7/16	1 3/16	1/4N-1/2P	1/2	1/8-3/32	5 1/2
7A, 8A-Com.....1938	6-3 1/8x4 3/8	.020	15B	.016C	.016C	A	Ch-8A	.025	2B	.020	35	5 1/2	14 1/2	105	2 3/16	1 3/8	45′	1/2	1/16-1/8	5 1/2
4C-President.....1938	8-3 1/16x4 1/4	.020	15B	.016C	.016C	A	Ch-8A	.025	TC	.020	33	8	17	105	1 7/16	1 3/16	45′	1/2	1/16-1/8	5 1/2
G-Champion.....1939	6-3x3 7/8	.020	15B	.016C	.016C	A	Ch-8	.025	1B	.020	35	5	10 1/2	105	1 13/16	1 1/8	5 1/2-6 1/2	1/2	1/8-3/32	5 1/2
9A-Com.....1939	6-3 1/8x4 3/8	.020	15B	.016C	.016C	A	Ch-8	.025	2B	.020	35	6	14 1/2	105	2 3/16	1 3/8	1/4N-1/2P	1/2	1/16-1/8	5 1/2
5C-Pres.....1939	8-3 1/16x4 1/4	.020	15B	.016C	.016C	A	Ch-8	.025	TC	.020	33	8	17	105	1 7/16	1 3/16	1/4N-1/2P	1/2	1/16-1/8	5 1/2
Champion.....1940	6-3x3 7/8	.020	15B	.016C	.016C	A	Ch-8	.025	1B	.020	35	5	10 1/2	105	1 13/16	1 1/8	1-2	1/2	1/16-1/8	5 1/2
10A-Com.....1940	6-3 1/8x4 3/8	.020	15B	.016C	.016C	A	Ch-8	.025	2B	.020	35	6	14 1/2	105	2 3/16	1 3/8	N1/4--1/2	1/2	1/16-1/8	5 1/2
6C-President.....1940	8-3 1/16x4 1/4	.020	15B	.016C	.016C	A	Ch-8	.025	TC	.020	33	8	17	105	1 7/16	1 3/16	N1/4--1/2	1/2	1/16-1/8	5 1/2
Champion.....1941-42	6-3x4	.020	15B	.016C	.016C	A	Ch-J8*17	.025	1B*18	.020	35	5	10 1/2	105	1 13/16	1 1/8	1-2	1/2	1/8-3/32 *20	5° 30′
Comm.....1941-42	6-3 1/8x4 3/8	.020	15B	.016C	.016C	A	Ch-8*17	.025	2B	.020	35	6	13	105	2 3/16	1 3/8	1/4N-1/2P*19	1/2	1/8-3/32 *20	5° 30′
President.....1941-42	8-3 1/16x4 1/4	.020	15B	.016C	.016C	A	Ch-8*17	.025	TC	.020	34 1/2	8	15	105	1 7/16	1 3/16	1/4N-1/2P*19	1/2	1/8-3/32 *20	5° 30′

pin in the crankshaft hole. Rotate the crankshaft in the opposite direction to the tongue on the bearing insert and the insert will follow the shaft.

VALVE GUIDE REMOVAL 1935-42

Drive guides downward to remove. Install new guides from the bottom and pull into place.

CLUTCH REMOVAL 1935-42

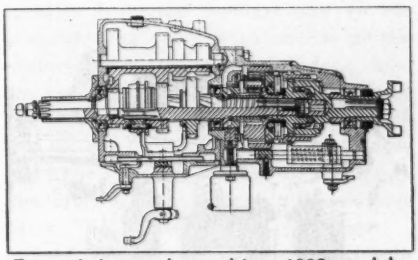
Remove clutch control shaft sleeve pins and push sleeve away from transmission toward frame side member. Unhook brake pedal pull-back spring from brake-pedal valve rod pin and from clip on clutch housing. Remove clutch housing bolts and screws, and remove housing assembly. Block clutch release levers and remove clutch pressure plate and spring assembly.

TRANSMISSION REMOVAL 1935-42

Disconnect battery, remove transmission floor plate and remove upper transmission to clutch housing screws. Raise rear of car to a height sufficient to permit working in the sitting position. Place a roller jack under engine. Remove propeller shaft assembly. Disconnect speedometer cable and remove old gasket; remove speedometer pinion and plug speedometer bore to prevent oil leakage. Also, plug opening around main shaft or overdrive shaft to prevent oil leakage. Disconnect gear shift levers at transmission. On 1939-42 only, remove rear engine support, clutch operating shaft sleeve pins, clutch housing to exhaust pipe bracket and lower engine. Remove lower transmission case to clutch housing screws and remove transmission. To install, reverse the above procedure.

OVERDRIVE TRANSMISSION REMOVAL 1941-42

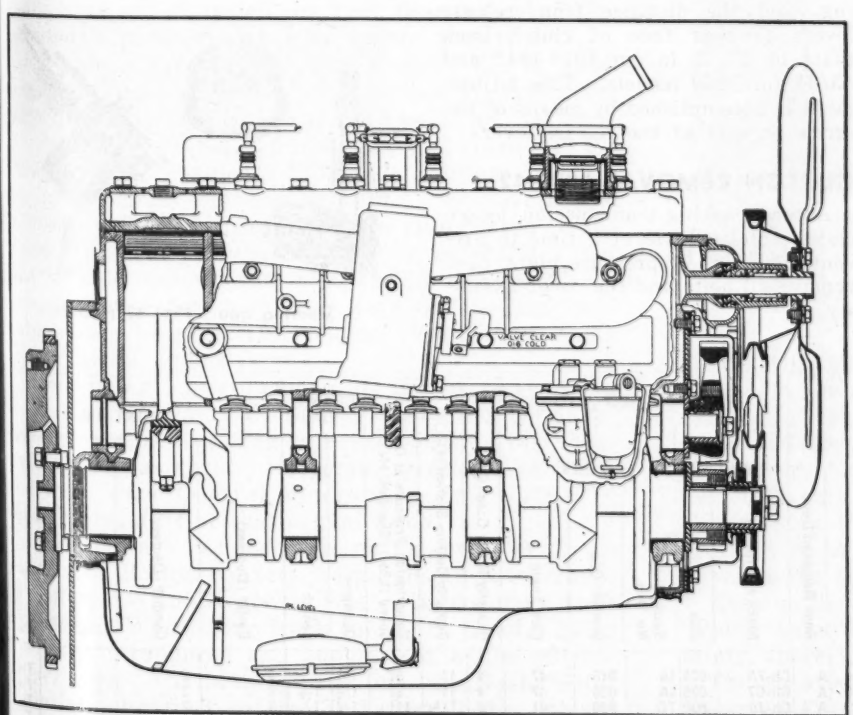
Disconnect battery, remove transmission floor plate and upper transmission to clutch housing screws. Raise rear of car to permit working in a sitting position. Place adjustable jack under engine. Remove propeller shaft assembly. Disconnect solenoid wires and overdrive control wire. Disconnect speedometer cable and remove old gasket; remove speedometer pinion and plug speedometer bore to prevent oil leakage. Also, plug opening around main shaft or overdrive shaft to prevent oil leakage. Disconnect gear-shift levers at transmission. Remove rear engine support, clutch operating shaft sleeve pins, clutch housing to exhaust pipe bracket and lower engine. Remove lower transmission case to clutch housing screws and remove transmission. To install, reverse the above procedure.



Transmission and overdrive, 1939 models.

PINION BEARING ADJUSTMENT 1936-42

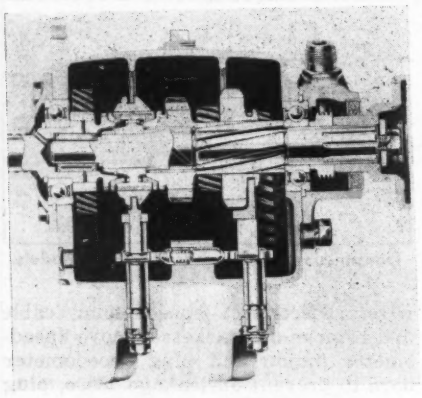
To adjust the pinion bearings, shims must be removed from between the space on the pinion shaft and the forward pinion bearing cone, if excessive end play exists. If the bearings are adjusted too tight, shims must be added. The pinion-bearing adjustment must be maintained when making the pinion endwise adjustment. To remove or add pinion bearing adjusting shims, it is necessary to remove axle shafts, rear housing cover, differential case and ring gear assembly and pinion flange and dust shield assembly. The pinion should be pressed out of the forward bearing toward the rear and the pinion oil retainer parts should be pried out. The pinion oil slinger and the forward pinion bearing cone can then be withdrawn for inspection. Remove or add shims as required. Install the pinion and the rear pinion bearing cone in the housing. Place a heavy drift against the head of the pinion. Hold the pinion in position and tap the forward bearing cone onto the shaft until it contacts the spacer on the pinion shaft and the shims. Install the flange and plain washer and tighten the nut. When correctly adjusted there should be a slight drag when the pinion shaft is rotated by hand.



Section through 1941 engine.

WILLYS

SERVICE DATA



Transmission assembly, 1941 models.

RADIATOR CORE REMOVAL 1937-42

Drain cooling system and remove radiator hoses. One nut from radiator brace rod, two anchor nuts and fan blades. (It is not necessary to remove the fan blades, but by doing so the operation is easier). Lift the core upward and out over the engine.

MAIN BEARINGS REMOVAL 1935-42

Main bearings are slip-in type. Pull engine and remove crankshaft as bearing inserts are held in place by dowel pins.

PISTON INSTALLATION 1935-42

Install pistons with the T slot opposite the camshaft.

PISTON CLEARANCES

Clearance at top .014 in. to .019 in. Bottom .003 in. Use a .003 in. feeler gage ¾ in. wide, should have 5-10 lb. pull on thrust side of piston, opposite T slot.

CONNECTING ROD INSTALLATION

Rod offset at lower end should be installed so that short side of offset is toward nearest main bearing. Oil-spray hole should face camshaft.

CLUTCH ADJUSTMENTS 1939-42

The release bearing and clutch pedal must be in their proper positions. No adjustment of the clutch proper is required to compensate for lining wear, but a clearance of approximately 1/16 in. should be maintained between release levers and release bearing. To obtain this clearance, the clutch pedal should be against underside of toe board. Then adjust the length of the clutch-control cable so that the pedal has a free movement of ¾ in. to 1 in. from the fully engaged position before resistance of springs is felt.

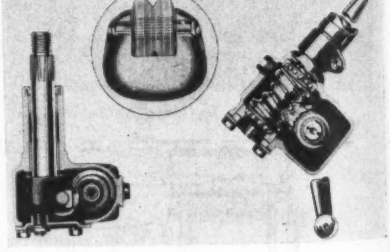
The three release levers must make simultaneous contact on release bearing, and the distance from release levers to rear face of clutch back plate be 27/32 in. on 1940-1942 and 45/64 for 1939 models. This adjustment is accomplished by means of the screw on each of the release levers.

CLUTCH REMOVAL 1936-42

After removing transmission, loosen clutch bolts a little at a time to prevent distortion of pressure plate, then remove all bolts and the cover assembly.

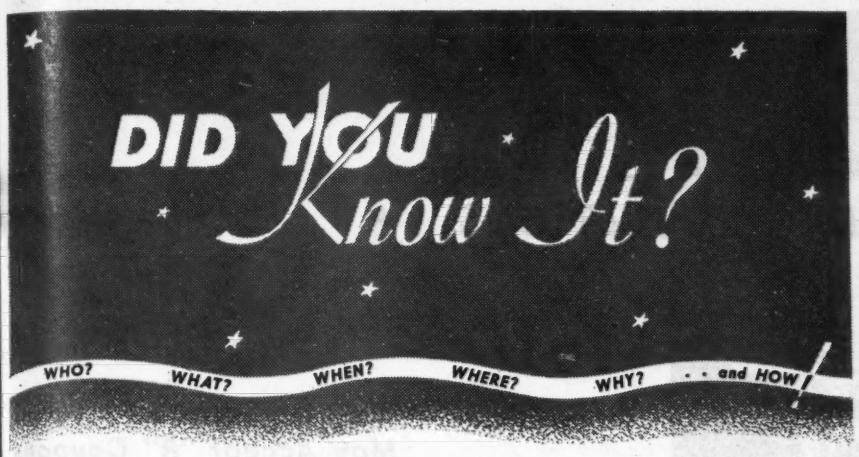
TRANSMISSION REMOVAL 1937-42

Remove floor mat and pull up on accelerating pedal rod to disengage rod from rubber socket. Remove floor and toe boards. Loosen radiator to body brace rod. Loosen radiator hold-down nuts; it is not necessary to remove entirely. Disconnect propeller shaft at front end. Disconnect speedometer cable. Remove lower nuts from rear mounting bolts at rear of transmission. Disconnect transmission shift rods at side of transmission. Be careful fan and water pump do not jam radiator core, and jack up rear of engine with board between jack and oil pan, otherwise the oil pan may be damaged by the jack. Mounting bracket at rear of transmission can now be removed. Raise transmission with jack under engine, until it clears cross member. Remove bell housing to motor bolts. Note: If aligning bolts are driven in from the rear, reverse them and drive in from the front, which will hold motor plate in position and make bell housing assembling easier. Remove transmission.



Steering gear, 1941-42 models.

MODEL	No. of Cylinders and Bore and Stroke	VALVES				Rods Removed from	IGNITION					Capacity Crank Case (Qts.)	Capacity Cooling System (Qts.)	Compression Pressure at Cranking Speed (Lbs.) (Standard Head)	CRANK-PIN		FRONT AXLE			
		Inlet Tappet Clearance for Valve Timing	Intake Valve Opens Deg. Before or After TC	Operating Tappet Clearance			Spark Plug		Timing						Diameter	Length	Caster (Degrees)	Camber (Degrees)	Toe-In (Inches)	Kingpin Inclination (Degrees)
				Intake	Exhaust		Make and Model	Gap	Spark Occurs—No. Deg.	Breaker Gap	Cam Angle									
37.....1937	4-3 1/16 x 4 3/8	.010	TC	.004H	.006H	A	Ch-7A	.025	4A	.018	47	4	11	87	1 1/16	.....	3	2	3/32	7 1/2
38, 48.....1938-39	4-3 1/16 x 4 3/8	.010	TC	.004H	.006H	A	Ch-C7	.025	5A	.020	47	4	11	87	1 1/16	1 1/16	3	2	3/32	7 1/2
440.....1940	4-3 1/16 x 4 3/8	.020	9B	.014C	.014C	A	Ch-J8	.030	TC	.020	41	4	11 3/4	111	1 1/16	1 1/16	3	2	1/16-1/8	7 1/2
Americar 441.....1941	4-3 1/16 x 4 3/8	.020	9B	.014C	.014C	A	Ch-J8*21	.030	TC	.020	41	4	11 3/4	111	1 1/16	1 1/16	3	2	3/32-5/32	7° 30'



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Motor Age will pay $10.00 each for acceptable short items or articles which are published in this department. They should be brief, preferably with a real humorous touch and, above all, should be of wide interest to those in the trade. They can be anecdotes regarding well-known men in the automotive industry, interesting bits about little known facts relating to the industry or its products, stories about unusual stunts or experiences with automobiles from the earliest day to the present. The general character of the material desired may be judged best by referring to the items on these pages and in this department in previous issues. The facts should be simply but plainly stated without any attempt, necessarily, to put them in publishable form. The Editors will see to that.

Send your contribution—every reader of Motor Age is invited to do so—to "Did You Know It?", Motor Age, Chestnut and 56th Sts., Philadelphia 39, Pa.

Nash Anniversaries

Charles W. Nash, board chairman of Nash-Kelvinator Corp., reaches another milestone this month. He and Mrs. Nash celebrate their 60th wedding anniversary.

Nash, who was 80 last Jan. 28, is still active, not only in business but in his hobbies. Last fall he went duck shooting in South Dakota with George W. Mason, president of Nash, and the latter reported that the years have not dimmend the keen shooting eye of the automobile pioneer. He is an ardent angler.

Born on a farm in De Kalb County, Ill., in 1864, Nash remained a farmer until he was 27, and never earned more than $300 in any one year in all that time. His wife's health failed for a time and Nash left the farm in 1891, moving to Flint, Mich., where he got a job in a grocery store at $1 a day. Because of his interest in craftsmanship, he soon transferred to the Flint Road Cart Co., one of the Flint enterprises that was making two-wheeled carts. The owners of the company were two men who were destined to build automobiles bearing their names. They were W. C. Durant and J. Dallas Dort.

From being superintendent of the carriage plant, Nash went to David C. Buick's "horseless carriage" factory as manufacturing superintendent. From there on his rise was rapid. He became president of Buick and then, when General Motors Corp. was formed he became president of that organization.

In 1916, Nash decided to go on his own. With the backing of Boston bankers, he purchased the Thomas B. Jeffery Co., of Kenosha, Wis. His company built the famous World War truck called the Quad. After the war, it produced and popularized a line of passenger cars. The latest of the line, the Nash "600," made its debut just before the United States entered the present war.—*Ed Warner.*

Foreseen by Ford

Twenty years ago, Henry Ford gazed into the crystal ball and made some predictions for the Silver Anniversary issue of *Automobile Trade Journal*, a publication since absorbed by MOTOR AGE. Some of his prophecies entitle him to high rank among soothsayers. Some of his predictions were:

"Motor coaches or stages will popularize passenger travel by motor road.

"Steam freight will have the long hauls and bulky loads. Lighter loads and short-haul loads will be generally distributed by motor freight express.

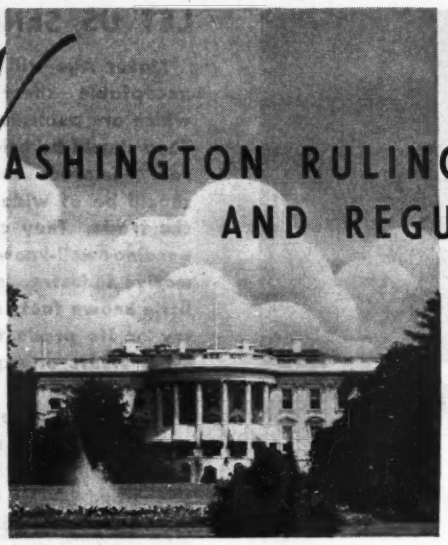
"The problem of future service will be to make and keep used cars as good as new.

"Crossing the Atlantic by airway will become an ordinary occurrence. In this connection, it will be well to watch the development of the helicopter."

Even on the subject of war, Ford was not far wrong. "Petty wars," he said, "will cease in Europe." Certainly, there is nothing petty about the present war.

The accuracy of these forecasts lends especial interest to Ford's recent declaration that the war in Europe will end in May.

WASHINGTON RULINGS AND REGULATIONS



Exchange Units to Speed Commercial Vehicle Repair

SO that the lay-up of trucks may be held to a minimum, the Office of Defense Transportation has announced a plan of exchanging rebuilt engines, transmissions, and rear-axle assemblies.

The units to be replaced will be exchanged at dealer shops. It is admitted that the demand for rebuilt units will probably exceed the supply at the outset, but the contemplated rebuilding program is expected to overtake demand quickly.

It is also announced by the ODT that WPB production schedules for 1944 included more than 18,000 new transmissions, and more than 7,000 rear-axle assemblies. The WPB has given assurance that approximately 138,000 engines will be added to carry through the replacement program.

To obtain an exchange unit, a truck operator will be required to show that it is necessary to maintain essential operation.

Smaller replacement parts will continue to be distributed according to the provisions of Limitation Order L-158.

Only Authorized Stations May Accept "R" Coupons

AFTER pronouncing the trial of the plan in Georgia and Florida a success, the OPA has now included the entire country in its ban on the redemption of "R" gasoline coupons at filling stations or other retail establishments unless the station has received permission from the OPA district director to accept "R" coupons because more than half its business consists of bulk transfers.

The effect of the plan will be that users of non-highway fuel will cash their "R" coupons at bulk stations and authorized filling stations after April 1, while those that patronize other retail outlets will use "E" coupons. The latter are still good for 1 gal. each, while the "R" coupon has a redemption value of 5 gal.

Dealers who are no longer permitted to accept "R" coupons and who have on hand some that were legally accepted before April 1, must attach them to gummed sheets, execute a

BURMESE GUMBO. American troops, attached to an engineers' division, struggle to free a jeep from deep mud on Ledo Road, the new Chinese supply route through Burma.

HOT GAS. The stack of gasoline ration books contains coupons for 3,000,000 gallons of black-market gas. It is part of loot seized in raids by the OPA in San Francisco.

★ ★ ★ ★

summary form, and surrender them before April 10 to a distributor in exchange for gasoline or to a local board in exchange for inventory coupons.

Lubrication Equipment Restrictions Are Eased

RESTRICTIONS on the sizes and models of lubrication equipment that may be manufactured under a recent amendment to Limitation Order L-134 have been lifted by the WPB. Equipment worth up to $35 may be purchased by repair shops each month without priority rating. Equipment in excess of this amount takes a priority rating of AA-5 or better.

Lubrication equipment is defined as "any new machinery, equipment, device, or appliance for dispensing grease, oil, or other lubricant, or for applying lubricant to any machinery or equipment at any point requiring lubrication; and includes general and special-purpose lubrication equipment, lubrication fittings, oil and grease cups and receptacles and hand oilers, as well as furnishings, accessories and appliances. It includes repair parts for any such equipment."

The new order prohibits manufacturers from fabricating or assembling metal shielded grease and oil barrel pumps, metallic backgrounds, panels, shelving and display boards, and certain other kinds of dispensing equipment.

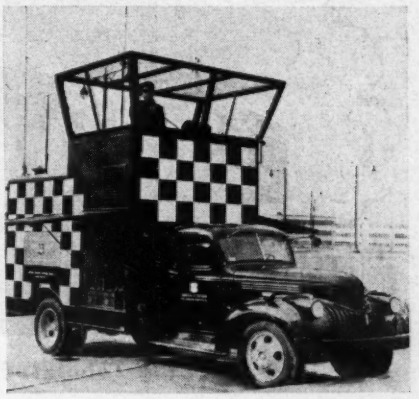
New Method of Pricing Rebuilt Parts Announced

WITH the announced intention of increasing the supply of replacement parts, the OPA has announced a new method of pricing rebuilt parts except rebuilt motors.

Under the new rules, the rebuilder may price a rebuilt part at 75 per cent of the manufacturer's original suggested retail price of the part when it was offered new to users, and at 65 per cent of the original price for sale to wholesalers and retailers.

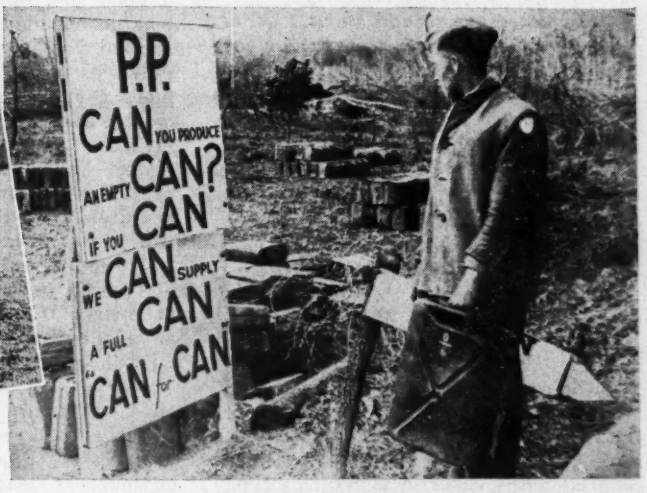
(*Continued on page* 96)

PARTS CARE. That is not a banjo in the zipper case but a master connecting rod, made in Studebaker's aircraft plant. Case protects surfaces on travels within plant.



ROLLING TOWER. Designed for newly won air fields in fighting areas, this mobile traffic tower carries its own electric generating plant. Glass protects officer from weather.

FOUR GI'S AND A JEEP. The Army's versatile and highly publicized vehicle is shown here as an improvised ambulance with ample room for four wounded men on litters.



ITALIAN CANCAN. It is not a dance in this case, but only a sign warning American GI'S that they cannot obtain more gasoline from fuel dump without returning empty can.

★

THE READERS'

CLEARING HOUSE

of Servicemen's Queries

Bill Toboldt, Editor, Motor Age

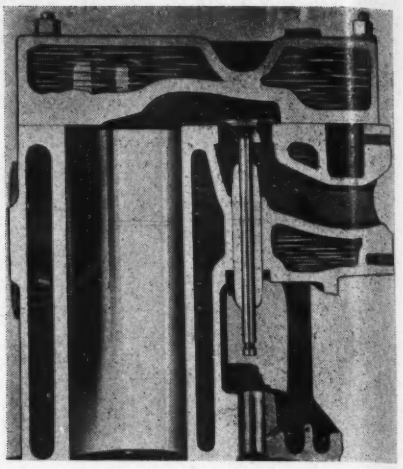
Radiator Loses Water

It is necessary to add about 1 qt. of water to the radiator of a 1937 Nash Lafayette every three or four days to keep it from boiling. Using it does not take much water; but, if I do not fill the radiator every 100 miles of driving, it seems to disappear by being forced out the overflow pipe.

I took the radiator off and boiled it out, and soldered the leaks, and now the radiator is clean and in good condition. Can you give me some help on this problem? — A Michigan Subscriber.

FIRST of all, you mention that you have had the radiator cleaned out and that you are sure it now provides free circulation for the water. I have seen so many cases in which this type of work has been performed and yet the radiator was not clean that I must mention it as a possible cause of the trouble. It is also quite possible that whoever cleaned out the radiator did a good job, but, if the engine itself was not cleaned out at the same time, the job was only half done. The water passages in the head and block collect more rust and sediment than the radiator, and this has to be cleaned out. If it isn't, then the circulation of the water simply carries that sediment around and dumps it into the clean radiator, and in a very short time the radiator is as badly clogged as before.

There is another source of this type of trouble, and one that needs careful attention. The cylinder head should be tightened down with a tension wrench to insure that it is tightened evenly at each bolt. If it is not tightened uniformly, the head will warp slightly, just enough to permit the compressed gas in the combustion chamber to leak out into the water passage. This gas under pressure will cause a rise in the water level, and naturally the water will pass out the radiator overflow pipe.



First of all, you should make sure that the cooling system is clean so that the water can circulate freely. Then you should install a new cylinder-head gasket and tighten the head with a tension wrench, applying 61 to 63 ft.-lb. of torque. Check the head again after a few days, while the engine is hot, and retighten with the same pressure to allow for the compression of the new head gasket. If the trouble persists you can then install an expansion tank on the overflow tube of the radiator.

Spark Plugs Fail

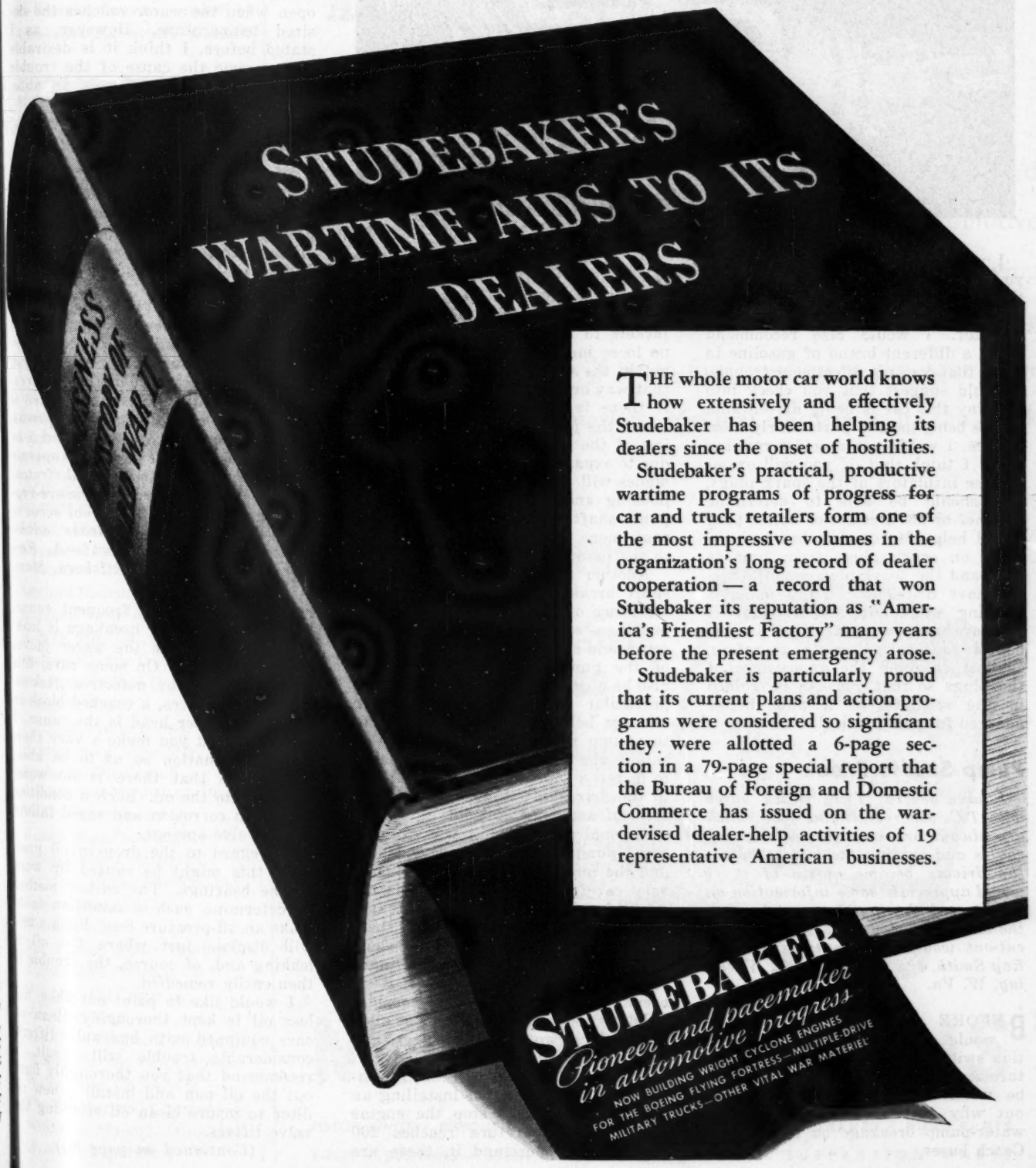
I have a 1939 Plymouth that has spark-plug trouble. This car was towed into the garage about two months ago, as it wouldn't start. We tuned it up. The spark plugs were shorted out, so we installed a new set. The car ran fine for about three or four weeks and again it wouldn't start. Again we found the spark plugs shorted through. This time we put in another make of plug. They lasted three weeks and again the plugs were shorted, so we put in another set like the first ones we installed. I haven't heard from the owner so far.

This car has no anti-freeze. I thought that may cause it. What seems strange to me is that all the plugs are the same. I have put them near heat and have checked them today but they are still the same. I would appreciate some information if you have any.—Z. J. Welle, 1950 N. Church St., Salem, Ore.

WITHOUT actually seeing the spark plugs you have been using in the 1939 Plymouth, it is rather difficult to determine just what is the cause of their failure. I note that you are using the type of plug specified by the manufacturer as well as the equivalent type. It would, therefore, seem to me that either the car is being used in some unusual service or that the gasoline is particularly poor or that the cooling system, in particular the engine water jacket, is badly clogged with dirt.

(*Continued on page* 64)

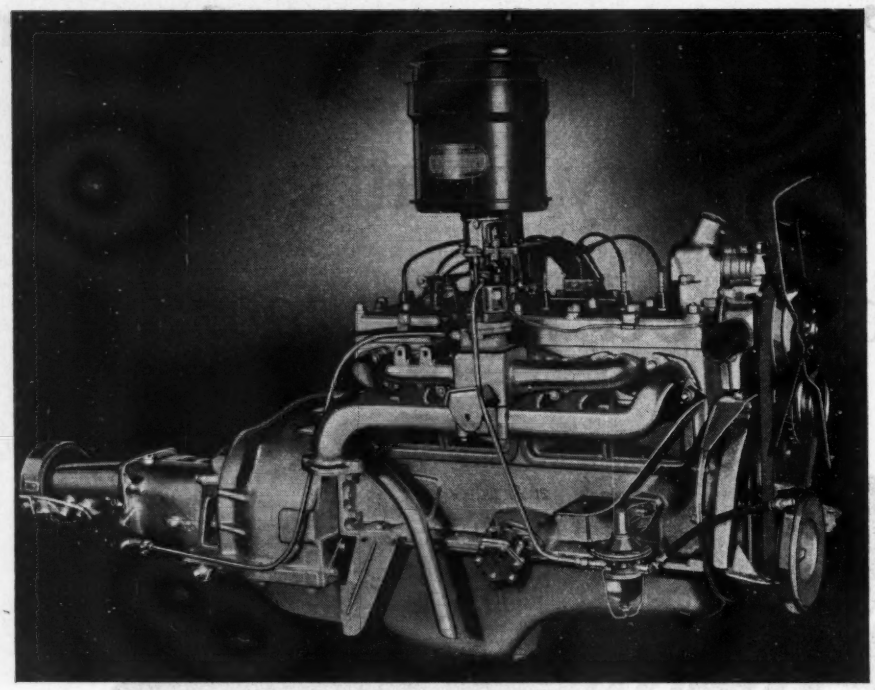
Here's *one* volume of wartime history that could be published *right now*


STUDEBAKER'S WARTIME AIDS TO ITS DEALERS
STUDEBAKER
Pioneer and pacemaker in automotive progress
NOW BUILDING WRIGHT CYCLONE ENGINES FOR THE BOEING FLYING FORTRESS—MULTIPLE-DRIVE MILITARY TRUCKS—OTHER VITAL WAR MATERIEL

THE whole motor car world knows how extensively and effectively Studebaker has been helping its dealers since the onset of hostilities.

Studebaker's practical, productive wartime programs of progress for car and truck retailers form one of the most impressive volumes in the organization's long record of dealer cooperation — a record that won Studebaker its reputation as "America's Friendliest Factory" many years before the present emergency arose.

Studebaker is particularly proud that its current plans and action programs were considered so significant they were allotted a 6-page section in a 79-page special report that the Bureau of Foreign and Domestic Commerce has issued on the war-devised dealer-help activities of 19 representative American businesses.



I would suggest that, first of all, you use some of the special solutions that are available and thoroughly clean out the engine water jacket and radiator. I would also recommend using a different brand of gasoline to see if that does not affect your trouble. I would suggest that you check into the way this car is being driven and, if it is being used in particularly hard service, I would use a colder-running plug. I think that, if you will examine the insulators of the spark plugs, you should be able to determine whether or not a colder or hotter plug would help. MOTOR AGE has had articles on spark plugs from time to time and the spark-plug manufacturers have distributed many manuals showing what happens to plugs if they are used in engines that are too hot or too cold. I would, therefore, suggest checking the appearance of the plugs so that you can be guided in the selection of a plug better adapted for this particular service.

Pump Shafts Break

I have several Twin Coach buses with T.C. 558 rear-engine jobs which are always breaking the water-pump shafts and ruining the motors before the drivers become aware of it. I would appreciate some information on how to cut the ignition switch when the temperature reaches 200 deg. This cut-out would work automatically.—Ray Smith, 324 Richland Ave., Wheeling, W. Va.

BEFORE making a device which would automatically cut the ignition switch when the engine temperature reaches 200 deg., I think it would be worth-while endeavoring to find out why there should be so much water-pump breakage on those Twin Coach buses.

As it is rather unusual to break water-pump shafts, I think it is important to make a very thorough check of the interior of the water jackets to make sure that there are no loose metal particles which might get in the water-pump blades and in that way break the shaft. In addition, if there is very little clearance between the pump blades and the housing of the pump, it is possible that, due to expansion from heat, the pump blades will finally bind or seize in the housing and in that way break the pump shaft. Naturally, if such is the case, more clearance should be given to the pump blades.

Another possible cause for pump-shaft breakage would be insufficient clearance of the pump shaft and the bushings so that the shaft finally seizes and shears. Lack of lubrication of the pump shaft bushings would also be a cause. If the pumps on these particular engines are shaft-driven and not belt-driven, misalignment of the pump might also be a cause. If this is the case, it might be possible to install a fabric-type universal joint in the driveshaft to overcome the effects of any misalignment.

I would suggest that you examine these pump shafts, the pump blades and the interior of the pump housing very carefully to see if there is not something which might indicate the cause of the failure. Actually, there is very little load on a pump shaft and there must be some extraordinary condition which would cause it to break. It might also pay to consider building new pump shafts out of alloy steel which would be stronger and more capable of resisting breakage.

I think you should carefully reconsider the advisability of installing an automatic switch to stop the engine when the temperature reaches 200 deg. As I understand it, these are buses and I would think that the company operating the buses would seriously object to the installation of such equipment, as it would seriously affect their running schedules and they would get many complaints.

However, you can obtain thermostats which will open and close electrical contacts at certain specified temperatures. Such thermostats can be obtained from heating and plumbing supply houses, and it should be a simple matter to install one in the top tank of a radiator and connect the contacts in series with the ignition switch so that the circuit would be open when the water reaches the desired temperature. However, as I stated before, I think it is desirable to overcome the cause of the trouble rather than to install such an automatic device.

Valve Springs Fail

We have a 1940 Lincoln-Zephyr that has given us considerable trouble with valve-spring breakage and excessive oil consumption, also loss of oil pressure, with the result that the hydraulic lifters would not operate properly.

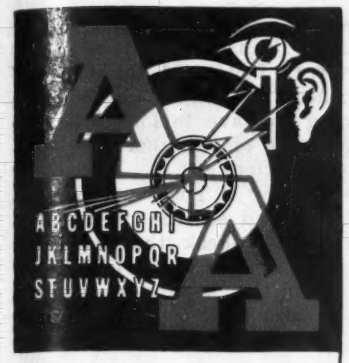
We have put in new rings, wrist pins, bearing inserts, valve springs and have cleaned the motor thoroughly. We are using 30 SAE oil and, when the motor is cold, the oil pressure runs at about 45 lb. but, when it warms up, especially at slow speeds, the oil pressure drops to around 5 or 10 lb. and the lifters do not operate as they should. We have tried stretching the spring under the pressure-regulating nut, but that does not seem to help any. Will you please advise what we might try next?—A. Ferreiro, 34 Forest St., Attleboro, Mass.

ONE of the most frequent causes of valve-spring breakage is leakage of water from the water jacket into the oil pan. On some cars, this may be caused by defective gaskets. In other instances, a cracked block or cracked cylinder head is the cause. I would suggest you make a very thorough examination so as to be absolutely sure that there is no water getting into the oil. Such a condition results in corrosion and rapid failure of the valve springs.

In regard to the drop in oil pressure, this might be caused by worn engine bearings. The easiest method to determine such a condition is to make an oil-pressure test. Such a test will disclose just where the oil is leaking and, of course, the trouble is then easily remedied.

I would like to point out that, unless oil is kept thoroughly clean on cars equipped with hydraulic lifters, considerable trouble will result. I recommend that you thoroughly flush out the oil pan and install a new oil filter to insure clean oil reaching the valve lifters.

(*Continued on page* 66)



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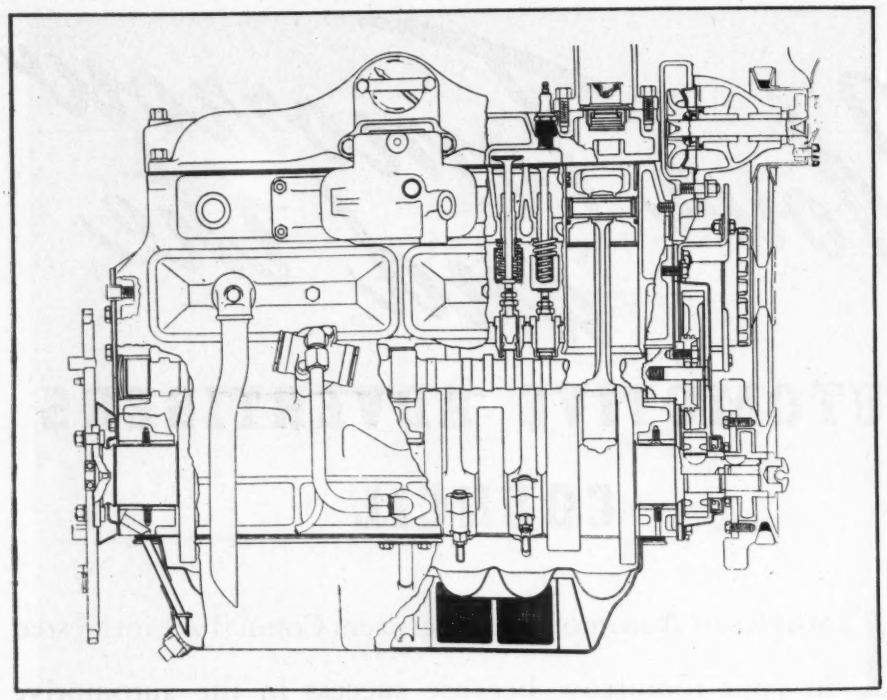


Elusive Noise

I wonder if you can give me any information on noise in a 1941 Hudson? This noise came all at once. We have checked camshaft, push rods and valves, removed timing-case cover, checked thrust washer and found it okay. Checked oil and fuel pumps, end play and crankshaft, cannot short out noise. Put car together again but engine had the same noise.—Oscar T. Colander, 321 Crescent St., Jamestown, N. Y.

IT is rather difficult to say what is the cause of the noise you are experiencing in the 1941 Hudson, particularly since you seem to have made a very thorough check.

When you were checking the camshaft, did you make sure that the cams themselves were not worn? I would suggest that you remove the valve cover plate from the side of the engine and then, while cranking the engine slowly by hand, make sure that all the valves lift an equal height. Also, when you were checking this engine did you make sure that the valve lifts themselves were in good condition?

I am inclined to believe that your trouble will be found either in the cams themselves or, more probably, in the valve lifters. Broken lifters are sometimes difficult to locate without removing them from the engine. However, I think that, in this instance, it would pay to make a very thorough check.

Speedometer Cable

What is the number of revolutions of the Stewart-Warner speedometer cable at 50 mph in the 1941 Hudson Model 10T, with rear-axle gear ratio of 4 5/9 and 16 by 5.50 tires?

Are the speedometer cable revolutions, for a definite speed in mph, standard regardless of the tire size, rear axle ratio and make of car?—Randall Smith, 235 N. Hamilton St., Gary, Ind.

AT 60 mph, the Stewart-Warner speedometer cable turns 1500 rpm.

There are two general ratios used in speedometer gearing. Some are geared 1 to 1 and others 2 to 1 and then, to get the correct speed, the necessary gears are used at the transmission end.

Gas Mileage Drops

One of my customers has a 1940 Dodge. On a trip made soon after he bought the car, he made about 20 miles per gallon. Then the voltage regulator went bad, and the generator was charging at the rate of 35 amp. at all times, with no cut-back. On a 900-mile trip, the gas mileage dropped to around 16 miles per gallon.

Please tell me what effect the heavy charging rate will have on motor power and mileage. I claim that a heavy charge from the generator puts more load on the motor than a lower rate of charge.—An Iowa Subscriber.

WHILE it is true that there is more engine horsepower required to drive a generator that is charging at the rate of 35 amp. than a generator that is charging at a lower rate, the difference is so slight that it would hardly show up in gasoline consumption. As a matter of fact, I worked out a hypothetical case of a generator charging 35 amp. and 10 amp. and attempted to find out how much less gasoline would be required by the engine to produce the 10 amp. charge. The answer was something like 1/10 lb. of gasoline. Since gasoline weighs 5.42 lb. per gallon you can see that 1/10 lb. is equal to about 1/6 fluid ounce. You could put it in your eye without blinking. So I think you are going to have to look elsewhere for the cause of this increased gasoline consumption.

I would try a good engine tune-up. Clean and set the plugs to the proper gap. Check the distributor points and, if necessary, install new ones. Clean the carburetor and check the operation of the automatic choke.

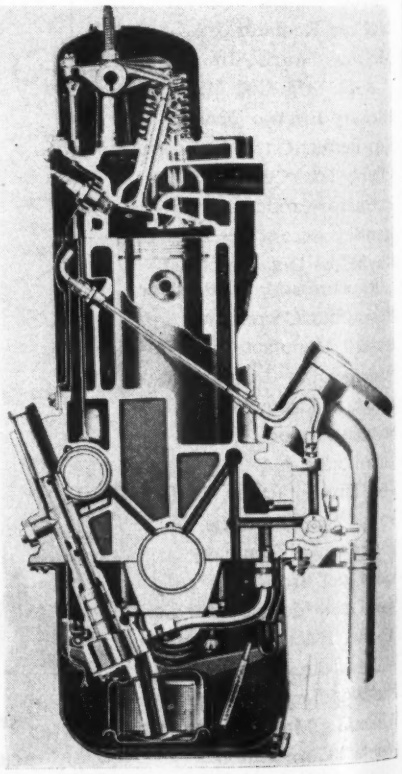
Noisy When Cold

I have a 1939 Chevrolet which, when it is started cold, had a noise for 7 or 8 min. This noise sounds like tight timing gears, except that it comes from along the side of the engine near the distributor.

The car has been driven approximately 7000 miles, and has had this noise from the day it was first put in service. It has used SAE 10 oil.

I should mention that the noise goes away after the engine has warmed up, but returns the next time it is started while cold.—An Illinois Subscriber.

SINCE this noise appears to be on the distributor side of the engine rather than in the timing gears, it might possibly be caused by the distributor-shaft drive gear where it mates with the spiral gear on the camshaft. It might be well to check the clearance between the teeth of these gears to see if they are too tight. There is also a possibility that it is a case of piston slap and you should check the piston clearance.



Keeping Spark Plugs Clean is RULE

KEEPING spark plugs clean is absolutely essential today. Slow speeds and lower grade fuels do not permit them to get hot enough to burn off rapidly accumulated fouling matter. Hard starting, incomplete combustion and gasoline waste result. Power is lost.

Be frank with your customers—tell them to expect to shift gears on hills—that low speed operation will cause fouled spark plugs, sticking valves, sludge accumulation in the crankcase, all of which, as you know, carry a wide variety of engine troubles in their wake—and not to expect or try for quick getaways.

Today every car needs spark plug testing and cleaning service. Every car needs it regularly and frequently. Make this one of your routine operations and you will be performing a genuine service to your customers and a nation at war. You will also perform a genuine service by installing Champions whenever new spark plugs are needed.

ARMY E NAVY

DEPENDABLE

Champion Spark Plugs

LET'S ALL BACK THE ATTACK—BUY WAR BONDS

Do We Have a Parts Crisis?

(*Continued from page* 25)

Although automotive maintenance equipment is becoming more scarce and a real need is developing for more jacks, tire pumps, and other service items, whose manufacture has been prohibited or limited since April 30, 1943, there appears to be little likelihood that Limitation Order L-270 will be modified soon.

However, reports are current that Limitation Order L-158, governing the production of parts, is ready for clearance. Officials who drafted the order had originally felt that production should be limited to purely functional parts because of manpower and material limitation. The term "functional" then had to be defined, because many parts now generally considered functional were at one time considered decorative. For example, radiator grilles, rear fenders, and hoods. It was finally decided that production of purely decorative parts would be prohibited.

A further promise of increased civilian supply of parts is seen in the announcement that Army requirements will be cut by at least 5 per cent. Army officials told MOTOR AGE that the entire Army parts procurement system is being revised.

Increasing demand for replacement parts for cars 7½ years old and older, which now constitute more than 7,000,000 vehicles, is inevitable. Need for parts for models between 1930 and 1936 is disproportionately high because many of these cars are being operated beyond their normal life expectancy. Wartime mileage limitations also are extending the life of this group of cars. As a consequence, there is a heavier demand than was originally anticipated by the automobile manufacturers and the parts makers for repair parts.

Wartime demand has drained off many salvaged parts from the repair market and numerous owners of older vehicles who would normally buy such parts have come back upon the new-car dealer and the manufacturer for parts to keep their cars in running order. This has been an added and unexpected drain on parts stocks. Some manufacturers are preparing to set up facilities to produce important functional parts, the demand for which they deemed their inventories could meet.

The salvaging and rebuilding of replacement parts is being stepped up under the pressure of wartime conditions. Of course, this was done before the war as a cost saver in certain parts but now it is being pushed by the government as a necessity to conserve materials and manpower. Fuel pumps, generators, armatures, shock absorbers, water pumps and starter drives are among the parts that are rebuilt and reconditioned. One company has 20 branches throughout the country engaged in this rebuilding process, with the rebuilding of replacement parts functioning on a miniature assembly-line basis. The government provision that a used part must be turned in wherever possible whenever a replacement part, either new or used, is acquired has proved to be helpful in parts conservation.

The inventory limitations of L-158 have minimized overstocking of certain parts, but wartime demand has greatly accelerated the turnover rate of both wholesalers and dealers and temporary shortages occur in some fast-moving items due to possible overstocking or a sudden unanticipated run on certain parts. However, such incidents happened in peacetime, so this is nothing extraordinary. But the increased wartime demand and the inability of the manufacturers to build up their inventories make them vulnerable to such sudden runs on certain parts.

Oversize pistons are a case in which there was a sudden transition from a slow-moving to a fast-moving part. Due to the operation of engines beyond their normal service life because of the impossibility of obtaining replacement engines or new vehicles, it has been necessary to install oversize

(*Continued on page* 70)

for LONGER LASTING REPAIR JOBS... USE BUNDYFLEX Original Equipment COPPER COATED METAL TUBING

Easy TO BEND Easy TO FLARE

Use Our FLAREMASTER Flaring Tool for a perfect double-lap flare.

BUNDYFLEX COPPER FUSED METAL TUBING MUCH STRONGER! – LASTS LONGER! ORIGINAL EQUIPMENT ON AUTOMOBILES, TRUCKS, FARM TRACTORS, OIL BURNERS, AND GAS APPLIANCES. WILL NOT BREAK OFF OR CRACK OFF AT THE JOINTS DUE TO 100% GREATER RESISTANCE TO VIBRATION FATIGUE. Can be Easily Bent – Flared – Brazed or Welded! EVERHOT PRODUCTS CO. CHICAGO, U.S.A.

GET THIS HANDY Dealer Display ASSORTMENT

- Attracts attention; creates sales, builds bigger profits for the dealer on replacement metal tubing.
- Contains the following fast selling sizes
  2—25-ft. coils 3/16" BUNDYFLEX TUBING
  2—25-ft. coils 1/4" BUNDYFLEX TUBING
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  1 Colorful SIGN and DISPLAY FIXTURE

LIST PRICE each $16.00 Dealer Price each $8.95

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IMMEDIATE DELIVERY: Your Jobber carries BUNDY-FLEX TUBING in 25-ft. coils, 1/8" to 5/8", for gas, oil and brake lines, etc.

DEALER PRICE $8.95

FILL IN AND MAIL COUPON TODAY

Be sure to give Jobber's name.

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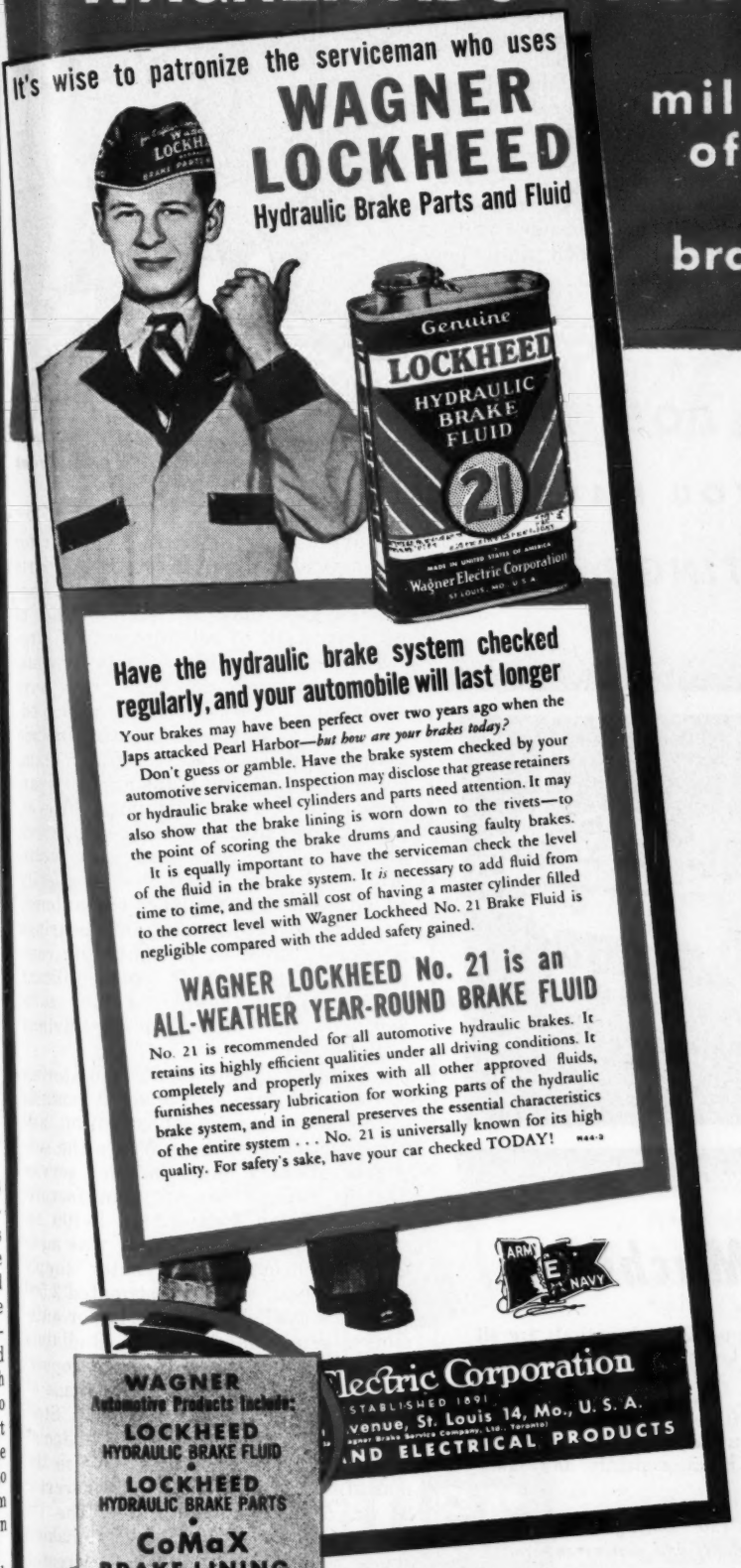
Deliver Dealer's Display Assortment of BUNDYFLEX Tubing to us, through jobber, at Dealer Price of $8.95.

NAME_____
ADDRESS_____
CITY_____ STATE_____
JOBBER'S NAME_____
JOBBER'S CITY_____ STATE_____

WAGNER ADS in POST and COLLIER'S remind millions of motorists of the importance of having brake systems checked


It's wise to patronize the serviceman who uses
WAGNER
LOCKHEED
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Genuine
LOCKHEED
HYDRAULIC
BRAKE
FLUID
21
Wagner Electric Corporation
Have the hydraulic brake system checked regularly, and your automobile will last longer
Your brakes may have been perfect over two years ago when the Japs attacked Pearl Harbor—but how are your brakes today?
Don't guess or gamble. Have the brake system checked by your automotive serviceman. Inspection may disclose that grease retainers or hydraulic brake wheel cylinders and parts need attention. It may also show that the brake lining is worn down to the rivets—to the point of scoring the brake drums and causing faulty brakes.
It is equally important to have the serviceman check the level of the fluid in the brake system. It is necessary to add fluid from time to time, and the small cost of having a master cylinder filled to the correct level with Wagner Lockheed No. 21 Brake Fluid is negligible compared with the added safety gained.
WAGNER LOCKHEED No. 21 is an ALL-WEATHER YEAR-ROUND BRAKE FLUID
No. 21 is recommended for all automotive hydraulic brakes. It retains its highly efficient qualities under all driving conditions. It completely and properly mixes with all other approved fluids, furnishes necessary lubrication for working parts of the hydraulic brake system, and in general preserves the essential characteristics of the entire system . . . No. 21 is universally known for its high quality. For safety's sake, have your car checked TODAY!
H44-3
ARMY E NAVY
Electric Corporation
ESTABLISHED 1891
venue, St. Louis 14, Mo., U. S. A.
AND ELECTRICAL PRODUCTS
WAGNER
Automotive Products Include:
LOCKHEED
HYDRAULIC BRAKE FLUID
LOCKHEED
HYDRAULIC BRAKE PARTS
CoMaX
BRAKE LINING
WAGNER
AIR BRAKES
TACHOGRAPH
(Recording Speedometer)

In 1944, as in previous years, Wagner's national advertising is constantly boosting the services of you men responsible for keeping automotive transportation rolling.

The timely message reproduced at the left is one of a series of two-color, half-page Wagner ads appearing regularly in the Post, and in Collier's.

You can do your part by offering to check the level of the brake fluid in all cars and trucks you service. When additional fluid is needed–use Wagner Lockheed No. 21 Hydraulic Brake Fluid. It is an all-season fluid, recommended for all hydraulic brakes.

And whenever brakes need to be repaired, you'll get parts of the highest quality by specifying Wagner Lockheed.

For details, consult your nearest Wagner jobber, or write us.

ARMY E NAVY

BUY U. S.
WAR BONDS AND STAMPS

NATIONAL SECURITY AWARD

H44-9

Wagner Electric Corporation

ESTABLISHED 1891
6498 Plymouth Avenue, St. Louis 14, Mo., U. S. A.
AUTOMOTIVE AND ELECTRICAL PRODUCTS

Do We Have a Parts Crisis?

(*Continued from page* 68)

pistons to compensate for wartime cylinder wear. Thus demand was increased beyond normal expectations for a particular part.

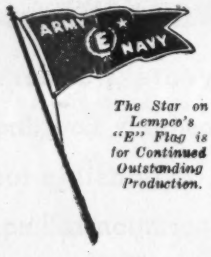
All limitations on producers' inventories of replacement parts were removed Nov. 13, 1943, by amendment to L-158. However, the parts move out to the field so fast that there is not much danger of overstocking in the factories at this juncture. Many manufacturers of replacement parts, including the automobile companies, are allocating their parts to dealers and distributors to insure an equitable distribution. Some parts makers base their allocations on pre-war orders, while others take into consideration the number of vehicles operating in a particular area and their specific requirements. This is designed to forestall the distributor who places similar orders with several wholesalers or manufacturers to insure his receiving the particular parts that he needs. Some manufacturers require a review of all back orders so distributors will not become overstocked with parts which may be vitally needed elsewhere.

"Short of help or not, that's positively the last time I want to hear you tell a car-wash customer, 'Whatsa matter with doin' it yourself? Did you break your arm?'"

Current shortages usually occur for a particular type of part or parts for a certain model vehicle. Thus crankshafts may be scarce, due to concentration of all automotive forging capacity on military requirements. Other temporary shortages that have occurred for certain makes and models of cars in recent months include cylinder heads, water pumps, main, connecting rod and transmission bearings, fuel pumps, cylinder sleeves, piston pins, transmission gears, shock absorbers, tie rods and king bolts. Much of the productive capacity which normally furnishes the automotive trade with gears and bearings is heavily involved in supplying components for aircraft and military vehicles, so the supply of such automotive items is limited for civilian replacement.

Increased supply of some materials in recent months has made it possible to abandon certain substitution and conservation programs where the substitute material gave inferior service life or was harder to manufacture. Revocation on Feb. 12 of L-106 restricting the uses of copper was made possible through the greater supply of that metal, with an estimated 2,500 tons now available quarterly for automotive replacement parts. Radiators had been limited to 71 per cent copper, so the cooling fins had to be made of steel as a wartime stopgap. Steel proved inferior from the standpoint of both durability and cooling so the manufacturers already have reverted to an all-copper radiator. The tin content of the solder used in making these radiators has been increased to facilitate production and improve the product itself. Copper also is now available for fuel and oil lines and brake and clutch-lining rivets, while it will ease the situation in ignition wiring and battery cables. In the case of cylinder-head gaskets, one

(*Continued on page* 72)

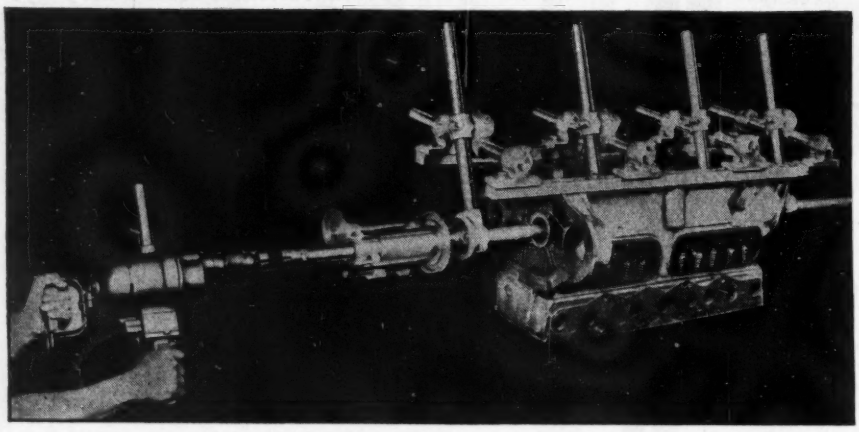


The Star on Lempco's "E" Flag is for Continued Outstanding Production.

EASY DOES IT . . .

WHEN YOU HAVE

FULL FLOATING DESIGN



HAND OR POWER Line Boring Machines

★ **Exclusive Full Universal Joints**

★ **Feeds Either Direction**

★ **Direct Reading Micrometer**

★ **Non-Creeping Tool Lock**

★ **Wear Take-up Adjustment for Chatter-Free Boring**

★ **Bores Camshaft and Main Bearings with Same Setting—It's Faster!**

Cross-bars, trunnion joints, and verticals are all full floating on the Lempco Model GE. Perfect alignment on main and camshaft bearings is practically automatic. It's the *only* machine with a direct fore and aft feed pull on the boring bar. It services all trucks, buses and passenger cars. Same set-up bores camshaft and main bearings.

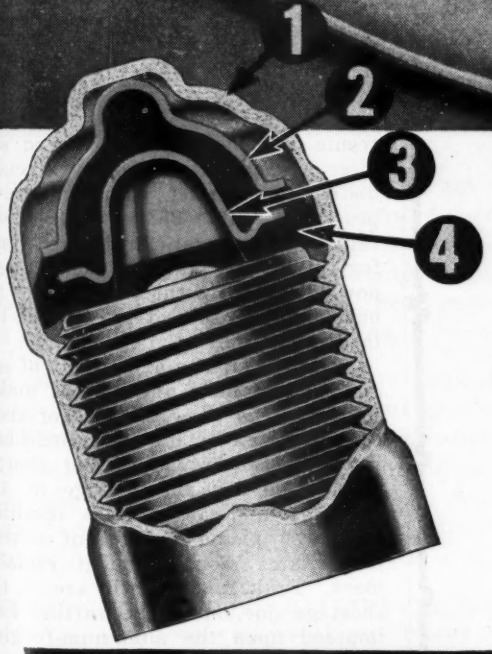
MODEL VGE: *2" x 120" Boring Bar for large industrial power plants and marine engines.*

WRITE FOR SPECIFICATIONS

LEMPCO

5727 DUNHAM RD., BEDFORD, O.

CEILING-PRICED



LOSS of tire air pressure costs your customers money in excessive tire wear. You can offset this loss, and add to your good will, by making sure that every tire you service is equipped with a Sealing Tire Valve Cap.

Schrader Tire Valve Caps screwed down finger-tight, have the features* that provide and maintain a positive seal. This seal *keeps air in* and keeps dirt out—prevents underinflation. No amount of vibration will loosen them—they will not work off.

To help conserve your customer's valuable rubber do these three things:

First: Make sure every tire you service is equipped with a Sealing Valve Cap.

Second: Whenever you check tire pressures replace the Valve Caps.

Third: Tell your customers why you are applying Sealing Valve Caps. It means dollars saved in additional tire mileage and prevents hours of roadside delay.

***SCHRADER FEATURES**

1. Valve Cap body or shell.
2. Brass Swivel Plate allows Cap Shell to turn independently of rubber washer as Cap is applied. This assures proper seating of washer and prevents distortion.
3. Brass Dome-Shaped Plate provides an **indestructible** chamber for safe clearance of valve core pin.
4. Molded Rubber Washer seals valve mouth when Cap is screwed on firmly by hand; while rubber between brass plates 2 and 3 provides spring action to **maintain** positive seal.

Schrader
REG U.S. PAT. OFF.
CONTROLS THE AIR

ARMY E NAVY

SCHRADER TIRE VALVE CAPS

Guaranteed Air-Tight Up to 250 Pounds Pressure

A. SCHRADER'S SON, ***Division of Scovill Manufacturing Company, Incorporated,*** **BROOKLYN, NEW YORK**

Do We Have a Parts Crisis?

(*Continued from page* 70)

manufacturer expects to continue making them of steel rather than copper, believing steel to have better sealing qualities on the newer high-compression engines with their higher combustion temperatures.

Intake and exhaust valves will have longer life and higher quality now that L-128, limiting their material content, has been revoked. Passenger-car exhaust valves will revert to steel containing 19 per cent chromium and 5 per cent nickel, instead of 9 per cent chromium and no nickel. Intake valves now may contain 1½ per cent chromium and 1½ per cent nickel instead of being made of NE steels embodying a small percentage of those alloys. Production of valves has been accelerated by revocation of L-128 because civilian and war-agency orers no longer have to be segregated in the plant. This latter practice required additional manpower. Chromium and nickel going to manufacturers is now adequate, although manpower still is a limiting factor. The quality and life of the automotive valves for passenger cars produced under the restrictions of L-128 declined to about the 1939-40 level but the return to former specifications will raise their quality to that of the 1942 product. Limited wartime driving and low-octane gasoline, however, shorten valve life.

Increasing availability of copper and tin has improved the outlook for engine bearings. Cadmium, although still on the critical list, is more plentiful than previously. Substitution of lead for tin-base babbitts makes it necessary that lubrication of the bearing surface be more adequate. Ford has developed a new tri-metal bearing of copper, silver, and lead, coated with tin or indium, which has stood up well so far under test. When this bearing is available in quantity, it will relieve the tight situation in Ford cadmium-alloy bearings. Some of the substitute bearing-lining alloys have not had the service life of pre-war bearings but the improving material prospects should make a return to pre-war types possible. Just now the labor shortage in many bearing plants has had an adverse effect upon production. This is aggravated by the requirements of lead-base babbitt which is more difficult to fabricate.

Roller bearings are still tight but recent slacking off of Army orders makes some improvement likely in the next six months. Ball bearings for civilian use also are limited. On occasions, this has affected the manufacture of water pumps and generators for civilian replacement.

A shortage of tungsten rod, caused by its heavy use in radar and electronic equipment for the armed services, has made it necessary to reclaim distributor contact points wherever possible. Up to 85 per cent of the returned contacts can be reclaimed for future use. Ignition contacts are now limited to a thickness of .03 in., but this tends to decrease service life in distributors.

Improved quality and supply of secondary aluminum for pistons makes it possible to produce more of these parts. Wartime driving conditions, imposing slower speeds and shorter trips, tend to cause sludge in the crankcase and clog oil lines, resulting in scored pistons. This, of course, necessitates more frequent replacement. Brake pistons still are on the shortage side, due to the wartime load imposed upon the aluminum-forging industry. With a surplus of primary aluminum, it is likely that some of it will be made available for automotive pistons, probably in the medium and heavy truck sizes.

Demand for mufflers has increased, due to corrosion brought on by low-speed driving and failure of the engine to warm up sufficiently and take care of the condensation. However, muffler manufacturers have modified their designs to minimize corrosion and meet these new driving condi-

(*Continued on page* 74)

MARK OF MERIT

The "know-how" gained in manufacturing over ten million replacement mufflers and pipes is built into MERIT MUFFLERS.

These quality mufflers are scientifically engineered, then thoroughly laboratory- and road-tested to meet the exacting standards established for products bearing the Mark of Merit.

Easy to install because they fit perfectly, Merit Mufflers are dependable in all respects.

Ask our jobber, or write us for his name

BASCA MANUFACTURING COMPANY, INC.
3001-3101 Roosevelt Ave. • Indianapolis 1, Indiana

MERIT HIGHEST QUALITY
REPLACEMENT MUFFLERS

PLAN FOR THE FUTURE WITH EXIDE

The Exide Periodic Recharge Program and the Exide Sure-Start Service Plan, featured currently in Exide national advertising, has made the car-owning public *battery-conscious* . . . is saving thousands of badly needed batteries, and has been instrumental in keeping millions of cars rolling.

In making your plans for after-war business, particularly in battery sales, be sure to get the benefit of Exide experience and prestige. Exide has the perfect plan to sell batteries with a minimum of effort and the maximum in profits to you. Read the 7 points of the Exide Merchandising Plan, then get in touch with the Exide Wholesaler.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

ARMY E NAVY

Exide
BATTERIES

Exide MERCHANDISING PLAN

To sell more batteries, with minimum effort at satisfactory profits

Exide QUALITY . . . Exide Batteries have long been known for their long-life, complete dependability and ease of maintenance.

Exide ADVERTISING . . . is constantly building ready-made public acceptance — Exides are easier to sell. The Exide sign adds prestige to any service station.

Exide MERCHANDISING . . . Exide Sure-Start Service —A proved battery service and merchandising procedure, tailor-made precisely for the service station. Helps to sell other services and accessories.

Exide EXPERIENCE . . . Proper storage technique as well as sales and merchandising problems competently covered by experienced Exide representatives working out of a network of Company branches located throughout the country.

Exide COMPLETE LINE . . . No lost business for the Exide dealer. There is an Exide Battery for every job.

Exide PROFITS . . . Exide's "BUY TO LAST" campaign has helped trade up battery purchases. The better the battery, the more profit in every sale and the better satisfaction to the car-owner.

Exide POINT-OF-SALE . . . Complete material is supplied to all dealers.

WHEN IT'S AN EXIDE YOU START

In the discharge of my official duty I shall endeavor to be guided by a just and unstrained construction of the constitution, a careful observance of the distinction between the powers granted to the federal government and those reserved to the states or to the people, and by a cautious appreciation of those functions which by the constitution and laws have been assigned to the executive branch of the government.

Grover Cleveland

Do We Have a Parts Crisis?

(*Continued from page* 72)

tions. Production is reaching record totals and material, chiefly sheet steel, is adequate but stocks are somewhat spotty.

Fan belts are another item for which there is great demand. Manufacturers are restricted to the use of reclaimed rubber, and such fan belts have a shorter service life than pre-war belts, which contained some crude rubber. Back orders are the rule in this field and suppliers estimate they could double their sales if the product were available. The labor shortage in the rubber industry has helped to restrict supply. Manufacturers also report demand for brake lining at an all-time high, although most of them are able to supply the increased needs. Brake parts are a little easier to get with an improved material situation, although the conversion of strip and sheet steel mills to steel plate has proved a hindrance.

Replacement batteries appear to be plentiful despite the fact there may be temporary shortages of certain lines. WPB has authorized production of an estimated 19,300,000 batteries in 1944, permitting manufacturers to make 110 per cent of their 1943 or 1941 sales, whichever is higher. However, plants in critical labor shortage areas are limited to 100 per cent of sales in 1941 or 1943. Again, manpower and competing military demands are the factors weighing against greater civilian supply. Limited and low-speed driving have resulted in more rapid deterioration of batteries. Failure to keep batteries charged results in formation of sulphate on the plates.

Tires are one of the chief deficit items in the automotive-supply picture. The Office of Rubber Director has scaled down its estimates on the number of passenger car tires to be produced in 1944 from an original 30,000,000 to 22,000,000 casings. Of this total, it is estimated only 7,000,000 will be turned out in the first half of the year. Some sources in the rubber industry are more pessimistic, estimating the year's output at 18,000,000 to 20,000,000 passenger car tires. This is against a possible demand for 60,000,000 passenger tires if they were available. Although production of synthetic rubber is increasing greatly, the amount available for civilian use is limited. There also is a shortage of labor and facilities for the fabrication of passenger-car tires. However, a $70,000,000 expansion program will bring some new facilities into production by July. The fact that synthetic rubber requires 25 per cent more time in processing also is a limiting factor in output of passenger-car casings.

The quality of passenger-car tires made from GR-S (Buna S) rubber is higher than was anticipated. It has been found that these tires perform satisfactorily except possibly in extremely high temperature or at excessive speed. Passenger tubes of synthetic rubber also have proved good, although production has been limited.

The outlook for replacement parts for medium and heavy trucks is more serious than that for passenger cars. Even though parts for these vehicles bear a preference rating of AA-1, compared with AA-2-X for passenger cars, their direct competition with the military-vehicle program makes them more difficult to obtain. The demand for truck replacement parts also has been heightened by more intensive use of vehicles and keeping them in service beyond their normal life. The quality of truck drivers also has declined and the standard of maintenance in fleet shops has deteriorated due to the manpower shortage. The

(*Continued on page* 76)

This year, with lower octane gasoline and still older cars, the problem of sluggish motor performance is critical—sludge and gum are more prevalent than ever.

For *maximum* protection against these evils, motors *must* be cleaned and *kept* clean—and Casite is the guaranteed answer!

As a tune-up through the carburetor, Casite does a quick and thorough cleansing job—cleans and frees sticky, gummed-up valves, rings and component parts. In the crankcase, it *stays in the oil* from one fill to the next; does its job with every engine revolution; *keeps* the motor clean and free-running.

The claims made for Casite are backed by millions of car owners who discovered its lasting benefits under the famous guarantee—Better and Smoother Performance or Double-Your-Money-Back. It makes fast friends wherever it is sold, and holds them, month after month, year after year.

With much of their peace-time merchandise curtailed, hundreds of dealers are finding in Casite, a new and dependable source of business to help fill the breach.

Why not talk it over with *your* jobber today?

YOU SELL CASITE ON THE *Double-Your-Money Back Guarantee*

- **Nationally advertised in The Saturday Evening Post, Liberty, Popular Mechanics, Popular Science, Science and Mechanics, Mechanix Illustrated, and leading farm papers.**
- **Used Summer and Winter by millions of car owners.**
- **Sells for 65c a pint . . . you make $6.24 on every twelve cars you service during the Spring and Summer Campaign.**
- **FREE POINT OF SALE advertising, and guarantee certificates packed with every 24-pint case.**

Guarantee

Add Casite to crankcase and run through carburetor according to instructions. Drive your car 100 miles or 60 days (whichever comes first). If not convinced that Casite gives **better and smoother performance,** you get **double your money back** by filling out and mailing guarantee certificate to The Casite Corporation, Hastings, Michigan, within 60 days from date of purchase. Maximum refund will be $1.30 per pint, which is twice the nationally advertised price of Casite.

THE CASITE CORPORATION • HASTINGS, MICHIGAN

Do We Have a Parts Crisis?

(*Continued from page* 74)

inferior material used in replacement parts because of wartime substitutions has been more pronounced in trucks because of more rugged use to which trucks are subjected.

Many truck operators have found that main and connecting-rod bearings were giving only one-half their pre-war service. With cadmium, copper and tin increasing in availability, it is expected that manufacturers will be able to revert to pre-war type bearings. The replacement valves, limited as to chrome and nickel content under L-128, also have failed to stand up like pre-war valves but again the easier material situation and revocation of L-128 is expected to remedy this difficulty. Axles, transmissions, and gears remain on the shortage list, but ODT will try to locate these parts when an essential civilian truck is down for lack of them. There may be temporary shortages of other truck replacement parts but in general the situation is very similar to comparable parts for passenger vehicles.

The rest of 1944 should find the material situation improving as sources of raw material increase and military demand slacks off somewhat. Manpower is likely to remain critical in some areas and some industries for several months. The same is true of manufacturing facilities. But any military cut-backs probably will be reflected in greater availability of manpower and facilities for civilian replacement parts. The only dark spot in the picture might be a sudden and unexpected military setback which would require an intensifying of war production in certain categories and a consequent slowing up of civilian output.

Tire Plant Starts

Award of a construction contract for the buildings which will house a new tire-manufacturing plant to be erected in Miami, Okla., by The B. F. Goodrich Co., has been made to the George A. Fuller Co., Washington, D. C.

Work will be started on the factory site immediately. The entire project will cost approximately $6,000,000.

Number of Automotive Wholesalers, Dealers and Independent Repair Shops—By States 1942-44

(As of February of Each Year)

	Wholesalers			Car and Truck Dealers			Independent Repair Shops			All Retail Outlets †		
	1942	1944	Numerical Change	1942	1944	Numerical Change	1942	1944	Numerical Change	1942	1944	Numerical Change
Alabama	83	87	+ 4	430	393	−37	304	302	− 2	819	748	−71
Arizona	33	33	....	157	119	−38	144	136	− 8	330	263	−67
Arkansas	80	81	+ 1	381	336	−45	306	273	−33	703	636	−67
California	535	510	−25	1,966	1,512	−454	4,921	4,111	−810	7,510	5,908	−1,602
Colorado	74	66	− 8	479	340	−139	543	454	−89	1,091	851	−240
Connecticut	104	95	− 9	580	522	−58	692	647	−45	1,462	1,325	−137
Delaware	14	13	− 1	75	64	−11	73	64	− 9	173	151	−22
District of Columbia	24	23	− 1	87	72	−15	153	122	−31	260	215	−45
Florida	117	105	−12	503	384	−119	563	464	−99	1,170	894	−276
Georgia	104	96	− 8	599	497	−102	374	335	−39	1,028	803	−225
Idaho	34	34	....	335	256	−79	219	202	−17	578	491	−87
Illinois	416	381	−35	2,381	1,991	−390	2,852	2,667	−185	5,579	4,895	−684
Indiana	210	187	−23	1,205	1,046	−159	1,147	1,046	−101	2,366	2,096	−270
Iowa	174	162	−12	1,459	1,111	−348	1,185	1,058	−127	2,835	2,235	−600
Kansas	135	120	−15	977	743	−234	810	661	−149	1,769	1,416	−353
Kentucky	105	92	−13	618	562	−56	422	374	−48	1,106	953	−153
Louisiana	75	70	− 5	409	353	−56	369	349	−20	816	708	−108
Maine	48	43	− 5	364	327	−37	410	384	−26	750	699	−51
Maryland	83	70	−13	471	411	−60	446	373	−73	950	813	−137
Massachusetts	223	195	−28	1,099	956	−143	1,154	1,041	−113	2,493	2,240	−253
Michigan	255	240	−15	1,840	1,580	−260	1,823	1,820	− 3	4,035	3,551	−484
Minnesota	128	131	+ 3	1,412	960	−452	1,647	1,555	−92	3,245	2,590	−655
Mississippi	76	66	−10	420	360	−60	199	170	−29	622	564	−58
Missouri	218	193	−25	1,041	897	−144	1,336	1,240	−96	2,512	2,201	−311
Montana	49	44	− 5	401	304	−97	563	225	−338	658	566	−92
Nebraska	96	74	−22	692	543	−149	720	597	−123	1,491	1,179	−312
Nevada	10	10	....	88	71	−17	94	81	−13	196	170	−26
New Hampshire	26	24	− 2	229	191	−38	250	200	−50	488	408	−80
New Jersey	191	165	−26	1,099	871	−228	1,751	1,477	−274	2,983	2,513	−470
New Mexico	36	30	− 6	180	134	−46	140	117	−23	338	265	−73
New York	521	453	−68	2,909	2,362	−547	5,078	4,418	−660	8,481	6,969	−1,512
North Carolina	132	133	+ 1	766	644	−122	485	471	−14	1,331	1,193	−138
North Dakota	24	29	+ 5	495	379	−116	468	391	−77	1,001	827	−174
Ohio	383	343	−40	2,282	1,689	−593	2,300	1,998	−302	4,809	3,964	−845
Oklahoma	138	125	−14	713	614	−99	805	694	−111	1,690	1,371	−319
Oregon	88	92	+ 4	474	365	−109	863	670	−193	1,427	1,073	−354
Pennsylvania	442	415	−27	3,182	2,708	−474	3,724	3,620	−104	7,349	6,818	−531
Rhode Island	29	28	− 1	167	130	−37	206	171	−35	402	333	−69
South Carolina	58	56	− 2	404	329	−75	245	221	−24	608	538	−70
South Dakota	32	30	− 2	411	325	−86	326	278	−48	756	638	−118
Tennessee	111	97	−14	496	418	−78	401	377	−24	935	825	−110
Texas	372	340	−32	1,985	1,664	−321	2,684	2,298	−386	4,816	4,107	−709
Utah	44	41	− 3	208	174	−34	242	210	−32	485	428	−57
Vermont	28	21	− 7	209	178	−31	282	241	−41	507	434	−73
Virginia	86	86	....	707	630	−77	645	643	−2	1,449	1,339	−110
Washington	141	136	− 5	769	559	−210	1,295	994	−301	2,148	1,609	−537
West Virginia	79	68	−11	504	420	−84	345	300	−45	889	761	−128
Wisconsin	142	143	+ 1	1,678	1,333	−345	1,416	1,248	−168	3,222	2,674	−548
Wyoming	25	25	....	201	173	−28	132	115	−17	383	302	−81
Total	6,631	6,101	−530	40,537	33,000	−7,537	47,552	41,903	−5,649	93,022	78,550	−14,472
Percentage Change	.....	.....	−8.0%	.....	.....	−18.5%	.....	.....	12.0%	.....	.....	−15.6%

Trade List Department—Chilton Company. †—Duplications eliminated. Includes, in addition to items shown, all exclusive accessory establishments and exclusive body and wrecker shops.

BLUE CROWN HUSKY

Controlled Heat Zone SPARK PLUGS

In the war for freedom the fate of humanity is being decided by the clash of countless machines of war on far flung battle fronts . . . and the timed coordination of the endless stream of transport vehicles that deliver the sinews of war to the points of conflict.

The march to victory becomes a reality only because of the efficient, dependable performance of myriads of spark plugs that kindle throbbing power and movement in the engines of war.

On the fighting fronts overseas and at home BLUE CROWNS play their part through their ability to stand up under fire and operate dependably where the going is the toughest.

MOTOR MASTER PRODUCTS CORP.
1800 Winnemac Avenue Chicago 40, Illinois

BUY MORE WAR BONDS
Work · · Lend
· · Give
★

The Vital Impulse that Sparks the Engines of War-

ATTENTION
OVERSEAS DISTRIBUTORS
BLUE CROWN'S
EXPORT
DISTRIBUTION
is Handled
Exclusively
by

A BLUE CROWN FOR EVERY PURPOSE IN PEACE AND WAR

BORG WARNER INTERNATIONAL CORPORATION
310 S. MICHIGAN AVE. Cable Address: BORINTCO CHICAGO 4, ILLINOIS

Dealers' Prosperity

(*Continued from Page* 23)

Once civilian production is resumed on a large scale, billions of dollars will be spent on new homes, some repairs, washing machines, refrigerators and a wide variety of needs and conveniences, but the first billions spent will go for new automobiles.

Of course, savings may shrink somewhat during the readjustment period. Employment must be held to a high level during reconversion and after if war workers are to be kept from dipping into their cash reserves for bare necessities. When we recall that there were 7,500,000 unemployed in 1940 and that working force has increased by perhaps 8,000,000 during the war, the task of re-employing returned service men and the workers who are to be turned out of war jobs assumes alarming proportions, but business is already tackling it. Business hope of success depends upon the freedom with which it is permitted to operate and the burden of taxes it will be required to shoulder.

Business could be relieved of uncertainty about post-war taxes by the enactment now of a tax law that could be held in abeyance until peace, as recommended by the Baruch-Hancock report on adjustment policies. Knowing the taxes it would have to pay, business could calculate how much capital it could profitably venture and what volume would be necessary to profitable operation.

Bureaucrats, with their jobs at stake, will clamor for government controls of production and distribution after the war. They will cry that peace will bring another of the emergencies that have succeeded each other with such disconcerting rapidity ever since 1933. Americans will reject the argument that post-war problems cannot be overcome without enslaving the individual to the state. They will base their opposition upon the incontrovertible fact that America has recovered from five major wars without being led or driven by bureaucrats.

The business-cycle chart of Leonard P. Ayres shows that every major war in which America has engaged has been succeeded by two or three years of marked prosperity. These recoveries have been interrupted by mild post-war depressions and then have forged ahead for eight or nine years to new high ground. To be sure, these long years of profitable business activity have ended in what Ayres calls secondary post-war depressions, but it cannot be shown that any bureaucrat's plan, if adopted today, would prevent a business slump 10 or 11 years hence.

Obvious as it is that several 4,000,000-car years will spell prosperity for factories and for dealers in general, it does not follow that every dealer can be guaranteed profitable new-car sales. The individual's fortunes will be governed to some extent by the number of dealers in the field and the conditions under which he is permitted to do business. And, of course, by the make of car he sells, for certain cars are going to get the lion's share of the post-war market, just as they got it before the war.

Two months ago, according to a Chilton count, there were 33,000 car and truck dealers doing business, a drop of 7500 since the country went to war. It goes without saying that the 7500 dealers will be replaced quickly once production of new cars is resumed. Factories will need wider distribution and new capital will be attracted by the promising retail market. Should new manufacturers enter the market, as seems probable, the number of new dealers naturally will be multiplied. However, dealers that have stuck out the war years will be favored by the factors; in the instance of General Motors, they have the pledge of corporation officials that they will get the first cars produced. Whether the dealer field will become overpopulated depends on several factors, not the least of which is the ability of existing dealers to handle the required volume of sales.

(*Continued on Page* 80)

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Use Your MRO Rating - Purchase from Your Jobber, $154.50
NOTE: You need no priority rating to buy, from your jobber, any of the products listed below. He gets them directly from us on Form WPB-547.
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5. Test Stands—(Generator, Starter and Magneto)
6. Tune-up Testers—(Coil, Condenser, Volt-Amp, Tachometer and Contact Angle)
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IT'S PATRIOTIC TO CONSERVE
When you weld, you save critical materials—and thus SPEED VICTORY! See your jobber or write us for full details on this heavy-duty Allen machine.
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These are filters—not projectiles. But projectiles might never reach their destination if these filters did not do their jobs first. They are a small but vital contribution to the huge war machine we have built to control the air . . . the field . . . and the seas.

The four plants of The Weatherhead Company have been making filters by the hundreds of thousands as one of its many contributions to the nation's war effort. Peace will find us prepared to resume making filters—and scores of other mechanical parts—for the machines that will reconstruct the world!

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CLEVELAND, OHIO
Manufacturers of vital parts for the automotive, aviation, refrigeration and other key industries.
Plants: Cleveland, Columbia City, Ind., Los Angeles. Canada—St. Thomas, Ontario

Dealers' Prosperity

(*Continued from Page* 78)

Several suggestions have been advanced by dealers to improve contractual relations after the war and to better their competitive position.

An idea that has received some support would have the form of factory-dealer contracts prescribed by law. This is not a new approach to the problem and one that is open to serious question, if only because it would make government the arbiter of business arrangements. Even if state legislatures could be induced to enact such laws, and courts to uphold them, it is likely that benefits would be outweighed by disadvantages. The possibility must be borne in mind that factories could distribute cars through factory branches if legal restrictions on their relations with dealers became too onerous.

An alternative is the proposal to license dealers. Several states already have licensing laws, varying in scope from North Carolina's, which provides no regulation whatever, to Wisconsin's, which licenses not only dealers and their salesmen but also finance companies, distributors, factories and factory branches. A bond may be required of the licensee in Wisconsin and licenses may be denied, suspended or revoked for coercion of dealers and cancellation of franchise without due regard to equities and without just provocation.

From the standpoint of the public, licensing of dealers has some merit, since it affords control over misrepresentation and sharp dealing, but the benefit to dealers is bound to be limited. The Wisconsin law, for example, forbids factories to load up dealers with unordered cars, but it does not attempt to limit the number of dealers in the state or to establish trade-in values for used cars. To prevent anyone from engaging in business would be contrary to the American system of free enterprise, and regulation of trade-in values would require a price-fixing law rather than a licensing law.

The type, quality and price of car to be handled by dealers after the war will probably be of little consequence at first, since buyers will be so eager for new cars that they will snap up the first ones made available. Later on, the type and price will assume the highest importance, for the car incorporating the greatest improvements will naturally find the readiest sale, and price will have a decided bearing on the volume of sales.

Buyers of both new and used cars have become accustomed during the war to paying inflated prices, but incomes are swollen abnormally. When peace comes and a surplus of workers drops incomes to peacetime levels, buyers will demand as much automobile they can get for the amount they have to spend. Indications are that a dollar will go only about three-fourths as far toward buying a car after the war as it did before.

The reasons are not hard to find. At General Motors, for example, hourly wage rates have increased 23 per cent since 1939. Material costs have increased all along the line. Ford not long ago was granted a 23 per cent increase by the OPA on a 1½-ton truck.

As a result of labor and material

(*Continued on Page* 82)

"I paid $5000 for her—but that included nine gallons of high test."

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MARVEL MYSTERY OIL goes to work TWO ways to keep aging wartime motors young and healthy. First, when you add it to your customers' lubricating oil, it halts excessive engine wear — because, it lubricates critical upper cylinder areas and protects valve stems and guides with *reinforced* lubrication. In high heat combustion areas, where ordinary lubricants fold up, Marvel Mystery Oil sustains its remarkable efficiency. Second, when you add it to fuel tanks, it improves the performance of today's low octane gas and prevents accumulation of power killing fuel residues and gums.

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This seal is found ONLY on BLACKHAWK HYDRAULIC JACKS—your assurance of a wise and safe investment.

BLACKHAWK

Dealers' Prosperity

(*Continued from Page* 82)

cost increases, the consensus among factory men is that the prices of post-war cars will be at least 25 per cent higher than those obtained before the war. A car listing at $800 in 1940 would thus cost $1,000 in 1945. Whatever the purchasing power of Americans after the war, it will purchase only 80 per cent as many $1,000 cars as it will $800 cars.

Purported plans of Henry J. Kaiser to produce a car to sell at $400 retail do not alter the picture in the slightest. Americans have had opportunities to buy low-priced cars in the past and the great majority of them have refused. In view of mounting costs, $400 will not put much of a car together after the war.

An English writer recently described the sort of car that might be built for $400. It "will have no lamps but just a disk of glass inset in a body pressing and backed by a bulb. It will have no windows but merely a sheet of transparent plastic sliding under finger pressure in two grooves pressed in the side panels. The car will have no cushions but merely a square of durable material slung from metal supports, after the lines of a deck chair."

Discussing Kaiser's chances of marketing such a car, this writer observes, "I think the retailer is the real crux of this Kaiser scheme, rather than any question of the sum per car to be saved by sheer brilliance in simplifying design." Despite airy predictions that inexpensive cars could be sold on street corners, experience has shown that factories succeed according to the strength of their dealer representation.

Physically, the first cars to be produced will, of course, be counterparts of 1942 models, with such appearance changes as can readily be made. The demand will be for cars, not for cars of advanced design. After the first wave of buying subsides, dealers can look for gradual introduction of the improvements developed immediately before the war and projected since that time. These are not likely to be radical.

A great deal of publicity was given a few months ago to high-octane gasoline and its effect upon engine design. Engines built to utilize the higher power of war-born fuels could be smaller, the stories ran, and from this assumption flowed a variety of guesses as to probable appearance. Little by little, it was realized that the ordinary automobile could not use 100-octane gas economically, and that 85 to 90-octane would probably be the limit. Just recently a refiner pointed out that, regardless of the desirability of 100-octane gas, the price would be too high for general use in cars and trucks.

This does not mean that the eventual post-war engine will not have a higher compression than was common before the war. It must have if it is to use the higher-test fuels. But the change probably will not be great enough to affect the size or general appearance of cars. It is more likely that improvements will be confined to the adoption of new materials, for lightness, durability or to achieve some other desired end.

One outstanding engineer last year predicted the three-piece bearing would dominate the field and that aluminum would be more widely used in pistons. He hazarded the guess that fuel injection would be adopted for gasoline engines and that cylinder liners would become popular. He thought that chromium-plated piston rings might be needed in higher-compression cars and that higher-grade steel would be needed for valves and valve springs.

Appearance changes are inevitable, but they are likely to be less drastic than the bizarre shapes dreamed up by popular illustrators. No factory is planning to put engines in the rear of its post-war cars and plastic bodies will still be an interesting experiment. Trim and decoration of plastic and metals little used before

(*Continued on Page* 84)

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AIR SAVERS.. TIME SAVERS
Hansen automotive air hose couplings have been first choice in the automotive field for the past twenty years because they don't leak, saving air, they're easy and fast to operate, saving time.
Hansen couplings are especially adapted for garages and filling stations. They are rugged and will take plenty of rough usage indoors as well as outdoors. Easily attached and detached, complete swivel action prevents kinking of hose and excessive wear.
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Gentlemen: Please send at once, no charge, the AC Shop Manuals checked:

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- ☐ How to Service Speedometers
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CITY_____

Dealers' Prosperity

(*Continued from page* 82)

the war are rather generally expected and refinements of various sorts are bound to come.

By and large, the factories will build cars, the public will buy, and the public, up until the war, has stubbornly declined to buy anything designed by Buck Rogers. It will, on the other hand, buy epoch-making quantities of dependable, attractive automobiles. And, if the tax burden is distributed with intelligence by Washington and business is encouraged in other ways to produce and provide jobs, the public will have the money to buy the cars it wants and needs.

Moves to New Plant

The Evans Reamer and Machine Co., Chicago, Ill., formerly known as the Evans Reamer Co., has moved to a new and larger plant in New Lexington, Ohio.

The new, enlarged facilities will increase greatly the production of Evans High-Speed Steel Expansion Reamers. Patented Dual-Spiral removable-blade Evans Reamers have enjoyed such a tremendous demand from aircraft, automotive, ordnance, and plastic manufacturing plants, that increased production was imperative.

Cadillac Plans Discussed

Immediate and post-war sales and service plans of the Cadillac Motor Car Division were discussed at Detroit the week ending March 4 between factory officials and the 50 district managers and parts and service representatives from the national organization.

Keynoting all meetings in the week's program were presentations designed to enable Cadillac distributors and dealers to maintain in 1944, through used car and service business, the profit showing made in 1943, when the national organization netted 80 per cent more than in 1942.

D. E. Ahrens, general sales manager, supervised all presentations. The field organization heard N. Dreystadt, general manager, outline the immediate and post-war outlook of this division at a dinner at the Detroit Athletic Club.

Departmental presentations were made by J. R. Browne, business management manager; R. L. Rickenbaugh, merchandising manager; George W. Otto, parts and service manager; E. T. Smith, organization manager; and Charles H. Betts, assistant merchandising manager.

Elected Vice President

At a meeting of the board of directors of the American Wire Fabrics Corp., B. L. Weaver was elected a vice-president, it was announced recently. The American Wire Fabrics Corp., a subsidiary of the Wickwire Spencer Steel Co. is said to have the largest capacity for the production of wire screen cloth and fabric in the world.

Weaver in 1941 offered his services to the government and for the past two years has been connected with the War Production Board as chief of the Steel Casting Section.

In his new position with the American Wire Fabrics Corp., he will have direct charge of and the responsibility for all operations at the Mt. Wolf Plant, Mt. Wolf, Pa. He will make his headquarters there.

Declares Extra Dividend

Directors of Stewart-Warner Corp. voted the regular, semi-annual cash dividend of 25 cents per share on the $5 par value common stock and a special dividend of 25 cents per share. Both dividends are payable June 1 to stock of record at the close of business May 2.

It takes more than an Artist to build a New Car

Design gives the new models a start in life but engineering, tooling and the thousand and one production operations must finish the job. Of the many component parts of an automobile, RBC BEARINGS were standard equipment for many makes in the past—and will be again when the revolutionary new models are brought to light. But for the present and for some time to come, bearings need care to provide every extra car mile for today's vital war transportation needs.

RBC

ROLLER BEARINGS

ROLLER BEARING CO. of AMERICA

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Where the impossible belongs to yesterday and every tomorrow is a challenge—This is America! ★ Where friction materials always were, and always will be, originated to anticipate the ever-changing, ever-challenging requirements of America—This is Raybestos! ★ Raybestos leadership in serving the Automotive. Heavy Duty, Industrial and Aircraft fields, and the drastic needs of war, is producing for you advanced brake linings and clutch facings exemplifying that progressiveness which says, "This is America! This is Raybestos"!

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AMERICA'S BIGGEST SELLING

BRAKE LINING

BRAKE LININGS, CLUTCH FACINGS, FAN BELTS, HOSE FOR CARS, TRUCKS, BUSES, TRACTORS ON THE WAR AND CIVILIAN FRONTS

Legally Speaking

A lawyer's interpretation of federal and local court decisions of interest to repairmen, presented each month

By C. R. ROSENBERG, JR.

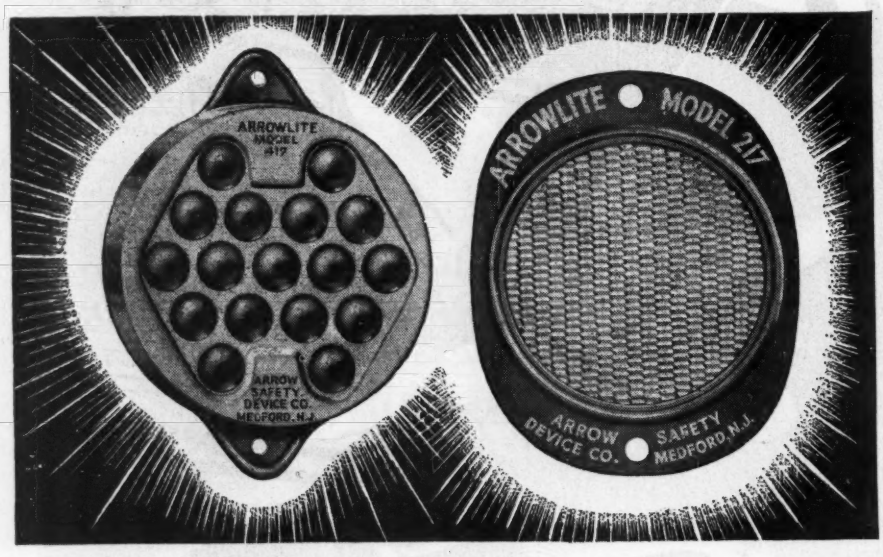
Employee Imprisoned?

That it's bad business for a repairman to take action "on his own" with respect to an employee suspected of theft or other misdeed was demonstrated in a recent New York case.

There the employer was the proprietor of a retail store. At the close of the day the receipts were checked and a shortage was discovered. The cashier in charge of the receipts, as she afterwards alleged, was not permitted to leave the store, although her hours of duty were ended. Becauses of this, she later sued the store for false imprisonment.

Backing the employee's contention that this constituted false imprisonment, the New York court said:

"As to the false imprisonment, she alleges that, on the occasion referred to, after business hours she was not permitted to leave the store, although her duties as an employee had terminated, and that the doors of the store were locked. We find here a sufficient allegation of an unlawful detention to sustain a cause of action." *Reese vs. Julia, 21 New York Supplement, second series, 99).*



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POWERFUL Arrowlite Reflectors—you'll find them on the Alcan Highway and you'll find them in Italy, India, and Australia. Like the Army and Navy vehicles that carry them, they are tough and powerful.

Here at home, you'll find Arrowlite Reflectors are standard equipment for many truck and bus manufacturers, as well as first choice of careful-buying fleet operators. Ask your jobber salesman about Arrowlite Reflectors or write direct for information.

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FOG LAMPS
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PARKING LIGHTS
STOP LIGHTS
TAIL LAMPS
DOME LIGHTS

ARROW SAFETY DEVICE CO.
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Service Part of the Deal?

In a lawsuit to recover the price of certain material, the buyer set up the defense that the seller had agreed to apply or install the material without any additional charge. As it turned out, the buyer had to install the material at his own expense, and he claimed that he should be permitted to deduct the cost of the work from the price of the material.

In this particular case, the court decided that the seller had not contracted to apply and install the material and that this work was to be done by the buyer at his own expense. Judgment was therefore given in favor of the seller for the full price of the material.

Repairmen, like other business men, sometimes buy equipment and merchandise on the understanding that the seller will furnish certain service in connection with the goods. Occasionally, however, such "understandings" develop into misunderstandings. Hence, where service to be performed by the seller is part of the deal, the entire transaction should be put into writing so that there may be do doubt as to just what the agreement includes. (*Brandin vs. Fornes, 183 Southern Reporter, 572.*)

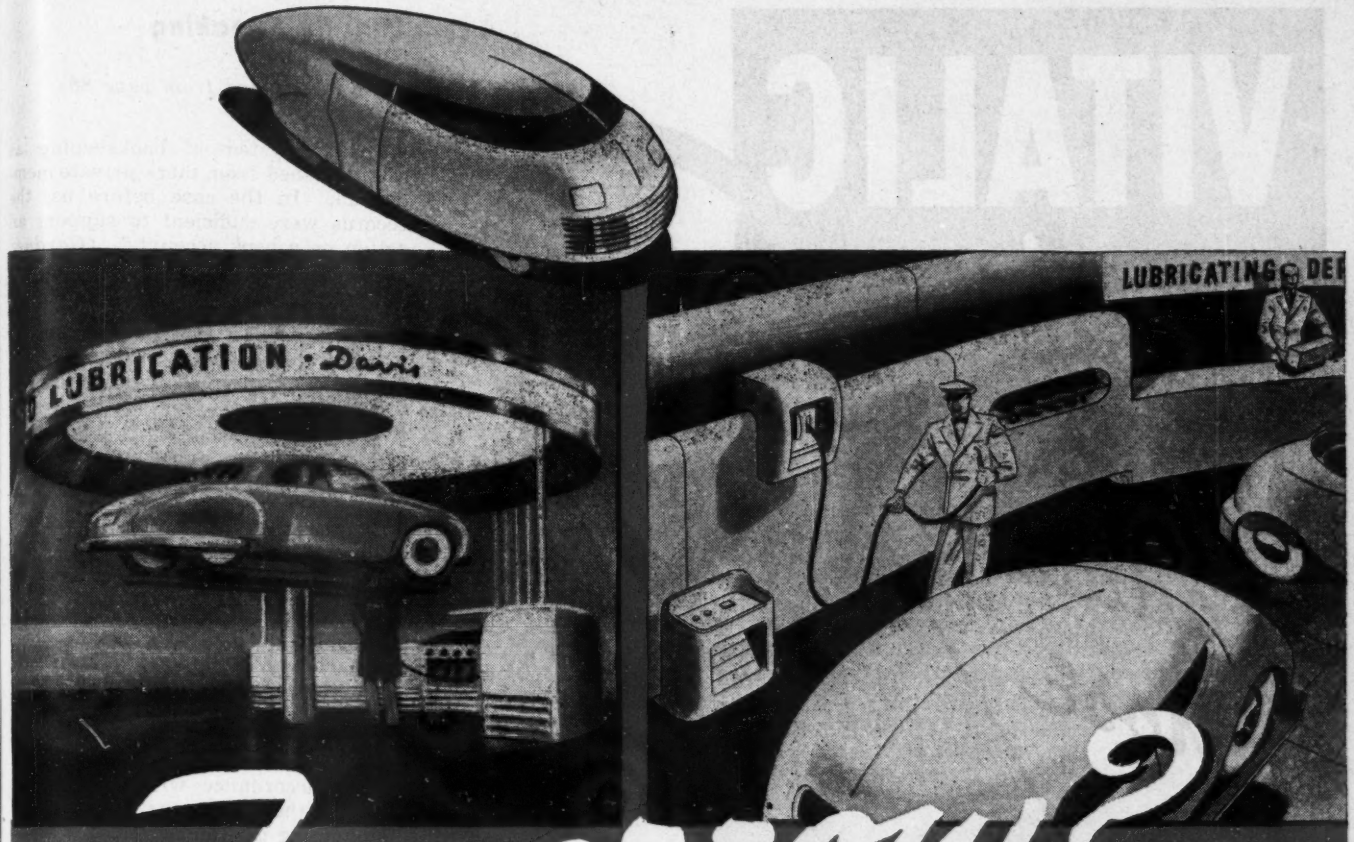
System of Bookkeeping Required

When a repairman becomes involved in litigation, his books and records may be vitally important. If he brings suit to collect the money due him on an account, he must be prepared to prove the account by his books.

In a recent case involving a claim on a book account, the California court explained the law's requirements with respect to bookkeeping.

"The law," said the court, "does not prescribe any standard of bookkeeping practice which all must follow, regardless of the nature of the business of which the record is kept. It makes no difference whether the account is kept in one book or several so long as they are permanent records, and con-

(*Continued on Page* 88)



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● Looking ahead as always... ARO Engineering today is doing ground-work thinking about your needs in lubricating equipment for postwar tomorrow.

ARO equipment to serve tomorrow's cars and tomorrow's way of living... will combine ARO-engineered improvements in design and ARO Dependability... appreciated so deeply today by users everywhere.*

In *your* thinking of tomorrow... think of Aro for *greatest progress* in lubricating equipment! The ARO Equipment Corporation, Bryan, O.

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* Many ARO models are available NOW. If you are in need of lubricating equipment talk to your ARO Jobber.

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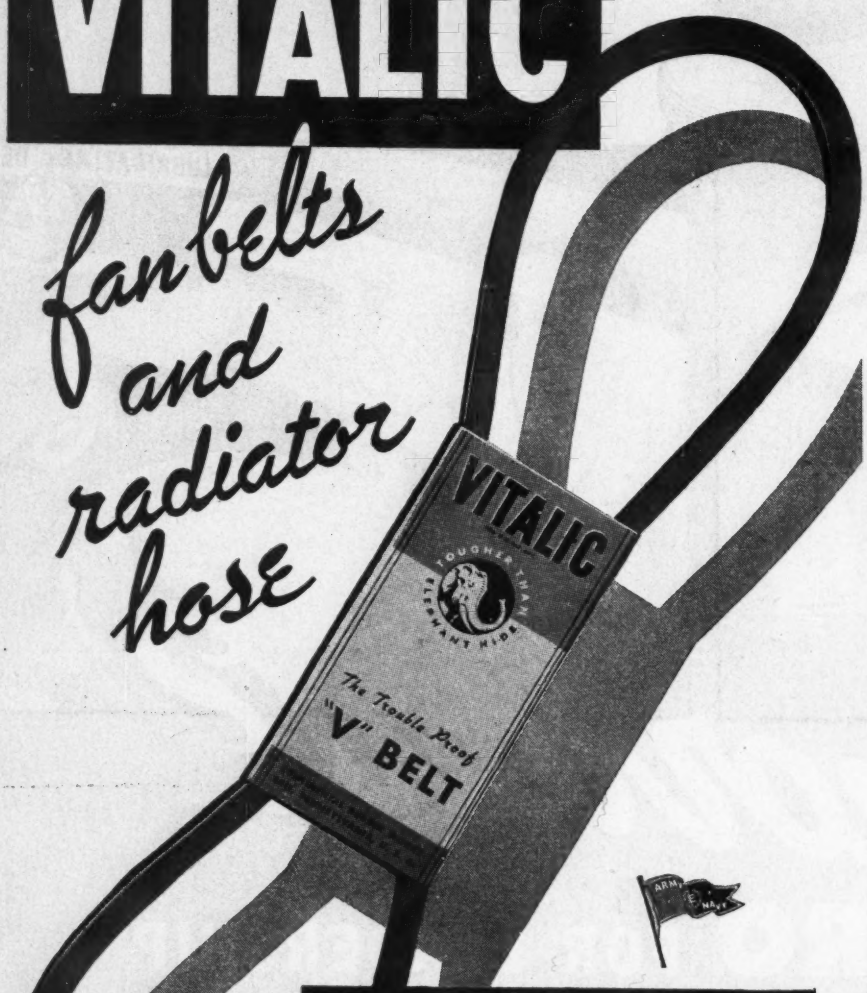

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is incorporated in every Vitalic product, whether war materials or civilian goods. That Continental has done a good job producing war materials is evidenced by the Army-Navy "E" Flag and Star for sustained excellence in production. ★ Production of Vitalic fan belts and radiator hose is limited only by war activities, and Vitalic jobbers are receiving their full share of war-time production.

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CONTINENTAL RUBBER WORKS

ERIE, PENNSYLVANIA, U. S. A.

Legally Speaking

(*Continued from page* 86)

stitute a system of bookkeeping as distinguished from mere private memoranda. In the case before us, the records were sufficient to support an action on a book account." *(Gardner vs. Rutherford, 136 Pacific Reporter, second series, 48.)*

Vending or Gambling Machines?

A vending machine may in itself constitute "a place of business" and be taxed just as if it were an independent store or establishment. That rather surprising result was developed in a recent Oklahoma court decision.

A dealer who applied for a license to sell cigarets had two cigaret vending machines in his place. The licensing authorities insisted that he must take a separate license for each machine just as if he had two separate places of business. This, they said, was in accordance with the statute imposing the license tax.

Upholding the imposition of a separate license requirement on each vending machine, the court said:

"Each vending machine is a complete unit dispensing cigarets at retail, a complete retail establishment. Each machine exercises the privilege granted to any other retail dispenser of cigarets. To place two or more on the same location would in no manner change the individual character of the machines." *(In re Cigarette Licenses, 82 Pacific Reporter, second series, 1069.)*

Another court decision, this time in Florida, points out that a vending machine may be a gambling machine in the eyes of the law if the machine is "adapted" to gambling purposes.

The court thought that, if a machine may be operated by inserting a coin and as a result the operator would receive something of value on the basis of an "unpredictable outcome," the machine is a gambling device. Referring to a previous decision in a similar case, the court said:

"A slot machine played with nickels that delivers a package of candy of the reasonable value of five cents and sometimes delivers, in addition to the candy, checks varying from one to twenty in number, which may be used for the further playing of the machine without profit and for amusement of the player only, is nevertheless a gambling device."

State laws on gambling vary, but, where a machine is so constructed that it may be very readily used for gambling on the basis of the so-called "unpredictable outcome," it is likely to be construed as a gambling device in practically all states. *(Eccles vs. Stone, 183 Southern Reporter, 623.)*

"Cannibalizing" Cars

(*Continued from Page* 19)

ment parts and repairs, but will have to forego that pleasure because it cannot get enough help. It cannot be done with volunteer personnel, as it is to some extent with groceries, because technical knowledge is required.

At present the draft is making inroads in government bureaus and it appears that the number of employees is decreasing. The resultant squeals would amaze even Sinatra.

More Gas for New Cars

DEALERS may now obtain special rations of gasoline to deliver new cars to buyers, regardless of the distance involved, the OPA has announced. Previously, the amount they could receive was limited to the gallonage necessary to drive 200 miles. The 200-mile limit is still effective where used cars are concerned.

Restrictions on gas for new cars were removed, the OPA explains, because stocks of new cars have been so greatly depleted that buyers are unable to find cars in their immediate area, and because transportation facilities are not available for moving the new cars.

Tire Overloads Costly

THE central tire-rationing boards organized by OPA from among industry experts have found that a large number of bus tires have to be replaced because of bead failures and blow-outs. This means, of course, that the tires are not being worn out but are being ruined by overloading. It represents quite a problem, because it is impossible to penalize a bus operator because he cannot regulate his loads in crowded cities and at war-plant gates.

Carrier Subsidy Asked

ODT has been asked to consider a subsidy for "for hire" truck operators by a committee representing the carriers. It does not seeem possible that ODT could see its way clear to subsidize "for hire" carriers without handing out folding money to all truck operators even if it could find a supply of cash.

U. S. Pipeline in Arabia Called "Fascist" by Oil Men

THE announcement of the Petroleum Reserves Corp. that the American government was to be put in ownership of a 1000-mile pipeline through Iran, Iraq and Saudi Arabia was labeled "Fascist" last month by the Petroleum Industry War Council.

Petroleum Administrator for War Ickes had explained that the pipeline would help supply the needs of Allied nations, even though it would not relieve the shortage in the United States. The Petroleum Industry War Council, on the other hand, shows that oil reserves, refineries, and oil facilities in the East are already in the possession of nationals of the Allied nations, and that none of the Axis nations exercises ownership over any oil reserves. Says the War Council:

"The Fascist approach—the corporative state, with its lust for imperialism—the shackling of free American enterprise, not to better serve, but to displace private enterprise, at not only the risk, but with the certainty, of international political involvement.

"It is a sign-post of the new highway of international power politics not yet revealed to and approved by the Senate of the United States as an international commitment entered into with "the advice and consent of the Senate.' "

Previous to the announcement of the proposed pipeline in the Near East, statement had been made that American continental reserves were in danger of being exhausted, but these statements were spiked by the Petroleum Industry War Council. Ickes has vigorously denied ulterior motives in authorizing construction of the line.

The BARRETT B-39 "Steady-Rest" takes the weight of the drum and hub assembly off of the lathe shaft and assures perfect alignment at all times. You get a perfectly round, smooth finish on all drums. It eliminates vibration and reduces the drag that causes undue wear on bearings and lathe parts when the entire weight of the drum and hub assembly is carried on the lathe shaft without support. Get one for your BARRETT Lathe now.

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3. Rocker arm and locking device holds drum and hub assembly in position.
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CASS AVENUE AT TWENTY-FIRST ST. • ST. LOUIS 6, MISSOURI

Peace to Spur Service

(*Continued from Page* 21)

studying car sales records of the past few years.

For the five-year period ending 1941, an average of 3.5 million cars were sold each year. If this may be considered as the standard, at the end of 1944 there would be a pent-up demand for three times that amount or over 10 million cars. However, Detroit has never produced that many cars in a year and it is estimated that at least two years would be required to satisfy that normal desire for a new car. That method of estimating the volume of post-war car sales, of course, ignores the fact that during that period additional owners would feel the urge to purchase a new car. Neither is any consideration given to the economy of the country and the savings in war bonds which would still further increase the demand for new cars. It should be pointed out that there are other ways of making an estimate of post-war car sales (see page 22), but regardless of method used a large market is indicated.

Failure to get new cars will undoubtedly cause the owners to turn to repair shops to have their cars rebuilt and maintained. In this connection, it should also be pointed out that accessory sales will also be at high level as owners, failing to get a new car, will wish to "doll up" their car with accessories.

In addition to the volume of service business which may be expected in the post-war period, the type of repairs and maintenance is also interesting. In this connection it has already been pointed out that as a result of wartime driving, wear on piston rings and cylinders is accelerated. This is already reflected in an abnormal number of ring, piston and bearing jobs. As the war continues and the post-war period is finally reached, the number of such jobs will be increased. Tune-up jobs will also reach new highs as car owners endeavor to compete with the new post-war models.

Because of the scarcity of non-functional parts, many cars today are being driven without radiator grilles and even fenders. Such parts will undoubtedly be replaced as soon as they become available. In fact, appearance reconditioning of all types, including painting and sheet-metal straightening, should keep body shops extremely busy.

Due to low wartime speeds, it is possible that some car owners have delayed having their brakes relined. However, such work is only being postponed and, as soon as speed restrictions are lifted, the need for such work will become apparent.

A discussion of post-war time service would not be complete without consideration being given to the number of shops which will be competing for the maintenance dollar. During 1941, according to the MOTOR AGE statistical department, there were 95,000 service stations or repair shops. In February, 1944, there were 78,000. Undoubtedly, as soon as hostilities cease, the number of shops will increase to at least 95,000. That this number will be exceeded is entirely possible, as many men in our armed forces, having learned automotive maintenance in the Army, will open a repair shop on their return to civilian life.

Takes Dealership

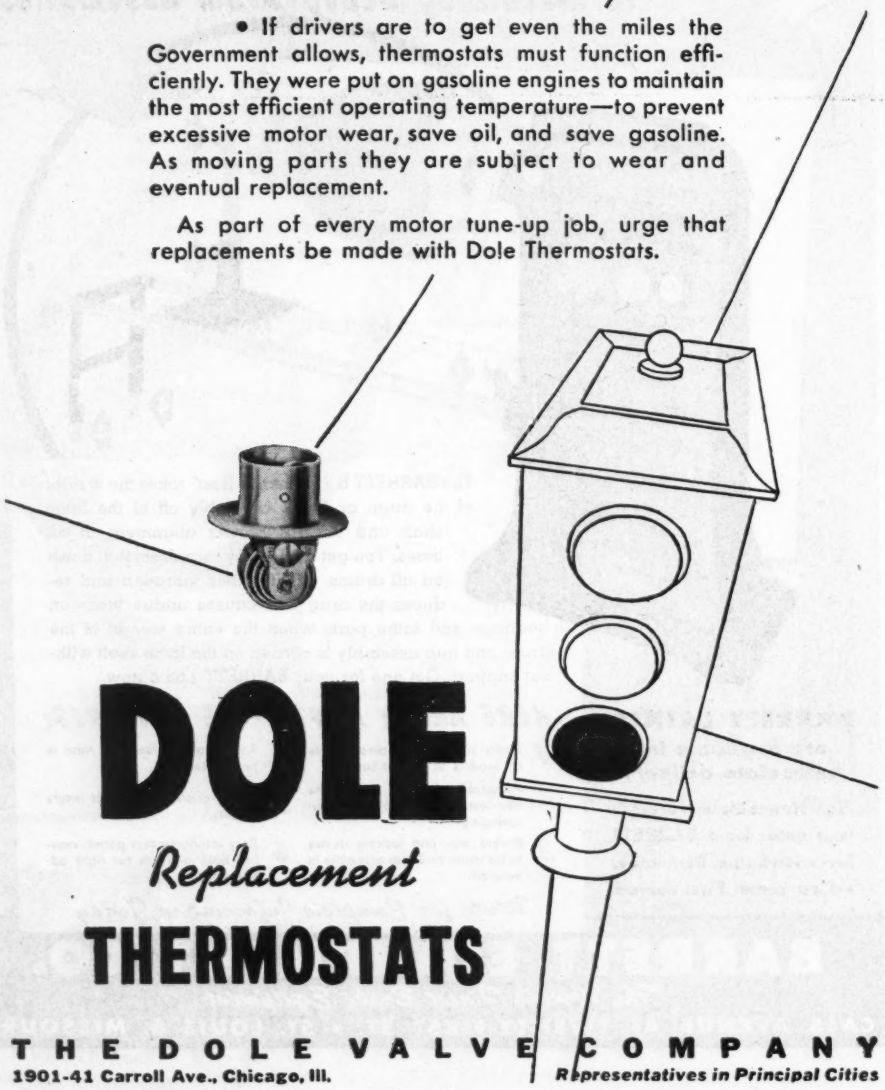
King M. Chase, for the past two and one half years assistant general sales manager of the Chevrolet Motor Division of Generel Motors, has resigned his post in the division's Detroit central office to take over the Hatch Chevrolet Co. dealership in Stockton, Cal., according to an announcement by William E. Holler, Chevrolet general sales manager.

In becoming the Stockton dealer, Chase follows in the footsteps of another former Chevrolet assistant general sales manager, H. B. Hatch, who went to Stockton from Detroit in 1938, and who is now retiring from business due to ill health.

No Government Restriction On Miles Per Gallon

• If drivers are to get even the miles the Government allows, thermostats must function efficiently. They were put on gasoline engines to maintain the most efficient operating temperature—to prevent excessive motor wear, save oil, and save gasoline. As moving parts they are subject to wear and eventual replacement.

As part of every motor tune-up job, urge that replacements be made with Dole Thermostats.



DOLE

Replacement

THERMOSTATS

THE DOLE VALVE COMPANY

1901-41 Carroll Ave., Chicago, Ill.

Representatives in Principal Cities

NINE LIVES FOR WAR-SCARCE *Batteries*

AUTOMOBILE Batteries today must be like the cat with nine lives. New batteries are scarce—so scarce that there aren't enough to go around unless the life of present batteries is s-t-r-e-t-c-h-e-d.

Long battery life is simply a matter of proper care . . . checking the charge; making sure that the plates are covered; removing corrosion from around terminals; keeping the battery tight in the carrier . . . and frequent recharging.

Doing these things regularly prevents "Battery Blackout" and a breakdown in essential wartime driving. It's a help in winning the war. It's also a help to your pocketbook—gives you additional income now and holds your customers for the day when gasoline, tires, and driving will again be on a peacetime basis.

When new batteries are necessary, replace with Globe Spinning Power, the battery that's built especially for wartime replacement service.

GLOBE-UNION INC., MILWAUKEE 1, WISCONSIN

ATLANTA • BOSTON • CINCINNATI • DALLAS • KANSAS CITY • LOS ANGELES
MEMPHIS • MINNEAPOLIS • PHILADELPHIA • SEATTLE

MA-444

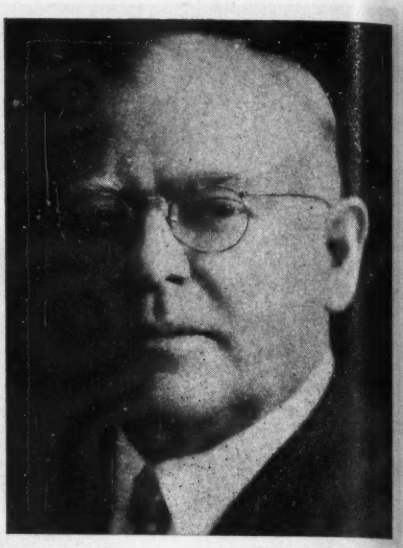
GLOBE *Spinning Power* **BATTERIES**

Truck Dealer Goes to Congress

OVERCOMING the popular appeal of a decorated war veteran, Dean M. Gillespie, White Truck dealer at Denver, Col., piled up a plurality of almost 3,000 votes in a special election last month to win the First Congressional District seat left vacant by the death of Lawrence Lewis. Gillespie is the first Republican to represent the district since 1930.

Gillespie's Democratic opponent was Major Carl Wuertele, a flier who had seen service in the Pacific and who had been mustered out of service on account of wounds. The major's campaign talks were popular because of his frequent references to his war experiences and for a time he seemed a likely winner. However, Gillespie made a dogged fight and, by winning, cut down further the Democratic advantage in the House.

Gillespie has been a White Truck dealer in Denver for 34 years. A native of Kansas, he went to Denver in 1905 and, after working in a grocery store, and operating a sign shop, he turned to automobiles and motor trucks. His White dealership is one of the largest in the country. In addition to his truck business, and a large up-to-date service shop, he operates a trailer-manufacturing plant. In the past, he has dealt in oil, real estate, and has been interested in other enterprises. He was successful in all of them.



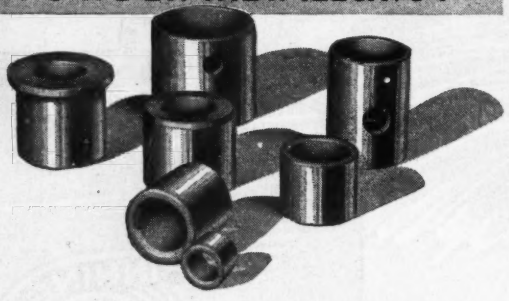
Dean M. Gillespie

In politics, Gillespie is opposed to bureaucracy and champions sound business sense in government. His campaign emphasized the advantages of hard work over swivel-chair theorizing.

JOHNSON BRONZE

POWDER METALLURGY

Ledaloyl SELF LUBRICATING BRONZE



for

AUTOMOTIVE APPLICATIONS

● Keeping the cars, trucks, and busses of America rolling — efficiently — is a war time duty for all of us. Johnson Bronze is ready and able to help you do your part. Remarkably good delivery can be had on bushings and bearings for such items as:

Generator
Water Pump
Spindle Bolt
Clutch Pilot
Clutch Finger
Distributor
Universal Joint
Steering Sector

Write for
NEW
LITERATURE

All of these parts are now produced from Johnson LEDALOYL Bronze . . . the ideal self lubricating bearing material. In addition to its copper-tin-lead content, Johnson LEDALOYL also contains graphite and, by virtue of its porous structure, holds up to 35% oil by volume. Millions of these parts now in active service is proof of their ability to perform efficiently, quietly, and for an exceptionally long period of time.

New descriptive literature is now available that will give you the complete operating facts. Write for it today.

JOHNSON BRONZE
SLEEVE BEARING HEADQUARTERS
The MOST COMPLETE SLEEVE BEARING SERVICE in the WORLD
455 S. MILL STREET NEW CASTLE, PA.

Extinguisher Body Elects

The Chemical Fire Extinguisher Association, at its annual meeting held March 3 at Chicago, elected the following officers:

President, Arthur G. Sullivan, general sales manager, Buffalo Fire Appliance Corp., Buffalo, N. Y.; vice president, J. O. Binford, general sales manager, American-La France-Foamite Corp., Elmira, N. Y.; treasurer, Herman W. Diener, secretary, George W. Diener Manufacturing Co., Chicago, Ill.; and commissioner, W. J. Parker, W. J. Parker, Inc., New York City.

Newly elected directors, in addition to the above, are George H. Boucher, general sales manager, Pyrene Manufacturing Co., Newark, N. J.; and E. A. Warren, vice president, General Detroit Corp., Detroit, Mich.

Chrysler Net Higher

On net sales of $886,467,702.34 during 1943, the Chrysler Corp. reports a net profit of $23,322,566.13, equivalent to $5.36 a share, subject to the provisions of the War Profits Control Act. Provision is made this year for federal income and excess profits taxes of $32,550,000.

The 1942 net sales amounted to $623,655,208, and the net profit to $15,529,013.

Two of many reasons why ...

If it's **DURO-CHROME**

it's a Doggone Good Tool!

Balance and PRECISION

The thousands of men and women in Automotive Service Work and Industry who think so highly of Duro-Chrome tools will tell you . . .

"They've got a Better Feel" . . . or
"They just seem to work better" . . . or
"They're easier to handle and Get the Job Done Faster" . . .

These are just other ways of saying Duro-Chrome tools have Balance and Precision. These qualities which are embodied in every Duro-Chrome tool are the product of twenty-eight years of Duro experience in Tool designing and specialization in tool manufacture from metallurgy to final operation.

Our Military and War-essential Industry requirements, today, have first call on Duro Tools. Insofar as consistent with these war requirements, every effort is being made to provide you with such Duro-Chrome tools as are essential to your job of Keeping 'Em Rolling. Before accepting anything less ... SEE YOUR DURO DISTRIBUTOR. Duro Metal Products Co., 2649 North Kildare Ave., Chicago, Illinois.

DURO TOOLS (HAND TOOL DIVISION)

The Mechanic's Best Friend

OVER A BILLION BUILT SINCE 1916

ALSO MAKERS OF DURO MACHINE TOOLS

New Pricing Method

(*Continued from Page* 61)

For sales to wholesalers or retailers to ultimate consumers, the price may not exceed 85 per cent of the original manufacturer's suggested retail price.

A rebuilder who had a list price already established may continue to sell at that price if he so elects. The new prices, however, are higher in most cases than those formerly in effect for rebuilt parts.

The percentage pricing method does not apply to persons who do not actually own the parts that are rebuilt, OPA points out. The rebuilding of parts owned by another person is a service operation and prices are governed by the provisions of the services regulation.

Other changes in the method of pricing rebuilt parts have to do with adding emergency costs incurred in sales, under war contracts or subcontracts with clarification.

Relief from Reports

A WELCOME piece of news for tire dealers came from the OPA last month when it was announced that only a comparatively few large dealers would be required henceforth to file quarterly inventory reports. It is estimated that 70,000 tire dealers will no longer be required to file.

At the same time, the OPA announced that beginning April 1 all restrictions on the number of tires and tubes allowed to be acquired by dealers would be removed, so long as the replenishment portion (Parts B) of a consumer's tire-ration certificate is given up for each tire bought.

Preference List Issued On Tire Repair Equipment

RETREADING, recapping, and repair equipment for passenger-car tires are 11th on a list which the WPB recently handed manufacturers of tire-repair equipment with instructions to produce items most urgently needed before filling orders of secondary importance.

First on the list are full-circle tire molds and matrices for airplane tires. Molds and matrices for tires used on tractor rear wheels, earth movers, tractor front wheels, trucks and buses all take precedence over equipment for passenger-car tires.

7 Days' Notice to Be Given In OPA Suspension Suits

BEGINNING April 1, no suspension-order proceedings will be instituted against persons alleged to have violated rationing regulations unless at least seven days' notice is given, the OPA announces. Previously, only three days' notice was required. The rule applies only to cases heard before OPA hearing commissioners.

The method of appealing from decisions of hearing commissioners has been changed. Appeals may be taken by filing a notice within 10 days with the Chief Hearing Commissioner in the regional office but a copy of the notice must be filed with the Hearing Administrator at Washington within five days thereafter.

Rules of evidence followed in U. S. district courts are to govern hearings, the OPA announces, but the hearing commission may relax the rules "where the ends of justice will be better served by so doing."

Must Sell Electric Motors

DEALERS, wholesalers, and motor agencies having fractional horsepower electric motors for sale are required to honor AA-3 preference ratings from repair shops if the motors in stock are not needed to fill orders bearing higher preference ratings, the WPB has announced. Any seller who fails or refuses to accept an order bearing a preference order may be required, upon written request of the person placing the order, to give his

(*Continued on Page* 98)

and plenty of Profit for You

SPRING IS HERE! To be sure it's not the Spring of other years when simple pride moved every motorist to "spark" up the finish of his pre-war car. This Spring it's different—the war's grinding on, but the end isn't in sight yet—not by a long shot—so it has become a matter of vital concern to all of us to protect the OUTSIDE as well as inside of our cars. Your customers don't need a War Transportation appeal to make them realize that protecting the finish of their cars now, means more than ever protecting a priceless investment.

Thousands of Service Operators aware of the need for reminding their service customers of this fact are making their futures brighter by using McAleer *SPEEDIE-RUB, POLISH and CLEANER* and *QUICKWAX* in their autobody refinishing and collision work.

You can do the same.

These fast-working, long lasting, long-profit automotive finishing materials are a natural solution to your wartime problem of *SELLING MORE SERVICE* . . . it's your chance to keep profits up despite rationing, scarcity of replacement parts and accessories.

It's your chance to help your old friends and customers weather the storm and make a nice tidy profit to boot. *TODAY* with the McAleer Finishing Line still available, you have a golden opportunity to build your future on the firm foundation of *customer cultivation.* Tomorrow, the research and knowledge gained through the development and perfection of war-time finishing materials promises a superlative line of new type finishing products. You can get any one of the profit-proven McAleer finishing materials from your local Jobber or by ordering direct from the Factory.

McAleer MANUFACTURING CO.
Quality-Controlled Finishing Materials
ROCHESTER, MICHIGAN

Spring Freshness for every DeSoto

WITH the freshness of Spring and the impulse to clean and repair, don't forget your faithful De Soto. Clean plugs, fresh paint here and there and well-tuned ignition, new oil for your crankcase and fresh packing for your gears and transmission—these are all simple things, easy and quick to do. But they can make a world of difference in the performance of your car. Remember, there's one expert in all these operations—that's your DeSoto dealer. He has the instruments and tools to check and freshen your De Soto for a summer's necessary driving. He has the extra parts in case you need a replacement. And he has the trained help should you need a bigger job of repair. So, here's to Spring Freshness for Every De Soto.

DE SOTO DIVISION OF CHRYSLER CORPORATION

"Minutes of care save wear and tear"

All of our dealers are extra busy these days — they're doing a big job in keeping wartime De Sotos running smoothly and economically. So, this Spring, when you're ready to have your car checked over, why not make it easier for yourself and your De Soto dealer by telephoning him for an appointment?

DE SOTO NATIONAL ADVERTISING tells this kind of story month after month

TUNE IN ON MAJOR BOWES, EVERY THURSDAY, CBS, 9:00 TO 9:30 P. M., E. W. T.

LET'S ALL BACK THE ATTACK — BUY MORE WAR BONDS

Must Sell Electric Motors

(*Continued from Page 96*)

reasons in writing for such failure or refusal. The buyer must be willing to meet the seller's regularly established prices and terms of sale or payment.

Recent Rulings

ANTI-FREEZE. The Chemical Bureau of the WPB has been given authority to direct the flow of alcohol anti-freeze solutions into various sections of the country. Distribution will be based upon vehicle registrations and weather conditions, the WPB has announced.

* * *

TIRE RETAILING. Combination wholesale-retail tire dealers doing a net volume of $100,000 a year in tires and tubes are not eligible to increase their stocks under the Feb. 15 amendment to Ration Order 1A. Under the amendment, they were made eligible to receive tires and tubes for stock, but this provision has now been revoked. The amendment was intended to apply only to wholesalers.

MOTOR CYCLES. Approximately 4,700 motor cycles are to be sold by the government as surplus commodities. The OPA has set a maximum wholesale ceiling price of $300, f.o.b. place of sale, plus handling and transportation, on the vehicles, and a retail ceiling of $400, f.o.b. place of sale, plus handling and transportation.

* * *

COUPON ENDORSEMENT. Even if an owner expects to be issued new license plates during the year, he will endorse gasoline ration coupons already in his possession with his old license number, the OPA has ruled. When the new plates are issued, the owner will write his new number on the cover of his ration book.

* * *

OFF-HIGHWAY GAS. Farmers and other off-the-highway users of gasoline are now required to endorse all E and R coupons which they exchange for gasoline, regardless of where the transfer of the fuel takes place. Endorsement consists of the ration holder's name and address, which need be written only once on each strip or block of coupons handed to the seller or on one coupon of the strip.

* * *

CAR SALES. Sales made by one dealer to another are classed by the OPA as retail sales in a recent amendment to Revised Price Schedule No. 85. These sales have become increasingly frequent since manufacturers and most distributors are no longer able to supply vehicles to areas where the shortage is acute.

* * *

SOLDER. The tin content of solder for use in the production of automotive radiators will be increased, the WPB has announced. The extent of the increase will be decided later.

* * *

ANTI-FREEZE. A total of 52,700,000 gal. of anti-freeze has been allocated by the WPB. Two per cent of this year's production will be retained as a reserve pool until after Jan. 1, so that WPB may use it in relieving emergency situations.

* * *

TRACTOR TIRES. Farmers are no longer able to obtain ration certificates for new rear-wheel tractor tire unless the tire has been worn beyond hope of recapping, the OPA has ruled. Previously, a certificate was granted for a new tire if recapping facilities were not available in the area to repair the old tire. Certificates for new front-wheel tires will still be issued in these conditions.

* * *

CHUCK GAGES. Under Limitation Order L-270, a chuck gage is defined as "any type of air-measuring gage which is attached in any manner to a flexible air line to be used for inflating tires." Manufacture of chuck gages is prohibited except for military requirements.

AUTOMATIC MAINTENANCE builds your TOMORROWS NOW

Every satisfactory repair job you turn out—every piece of machinery that you are servicing to outlast the war—these are your most valuable postwar assets.

Top-notch engine lubrication is the key to these aims, but only the best motor oil can give such results. That is why Pennzoil is recognized by increasing thousands of dealers as their "automatic maintenance man". It is especially refined to resist sludge and varnish. This allows valves to work more freely and piston rings to perform without loss of power. In short, Pennzoil preserves efficiency.

Dealers depend on Pennzoil products to see them through with a minimum of extra work and trouble. They make more money NOW, while they build a sound future. They know the goodwill they're creating will pay off in the postwar period when real competition sets in.

Identify your business NOW with this lasting reputation by displaying the Pennzoil red, yellow and black oval.

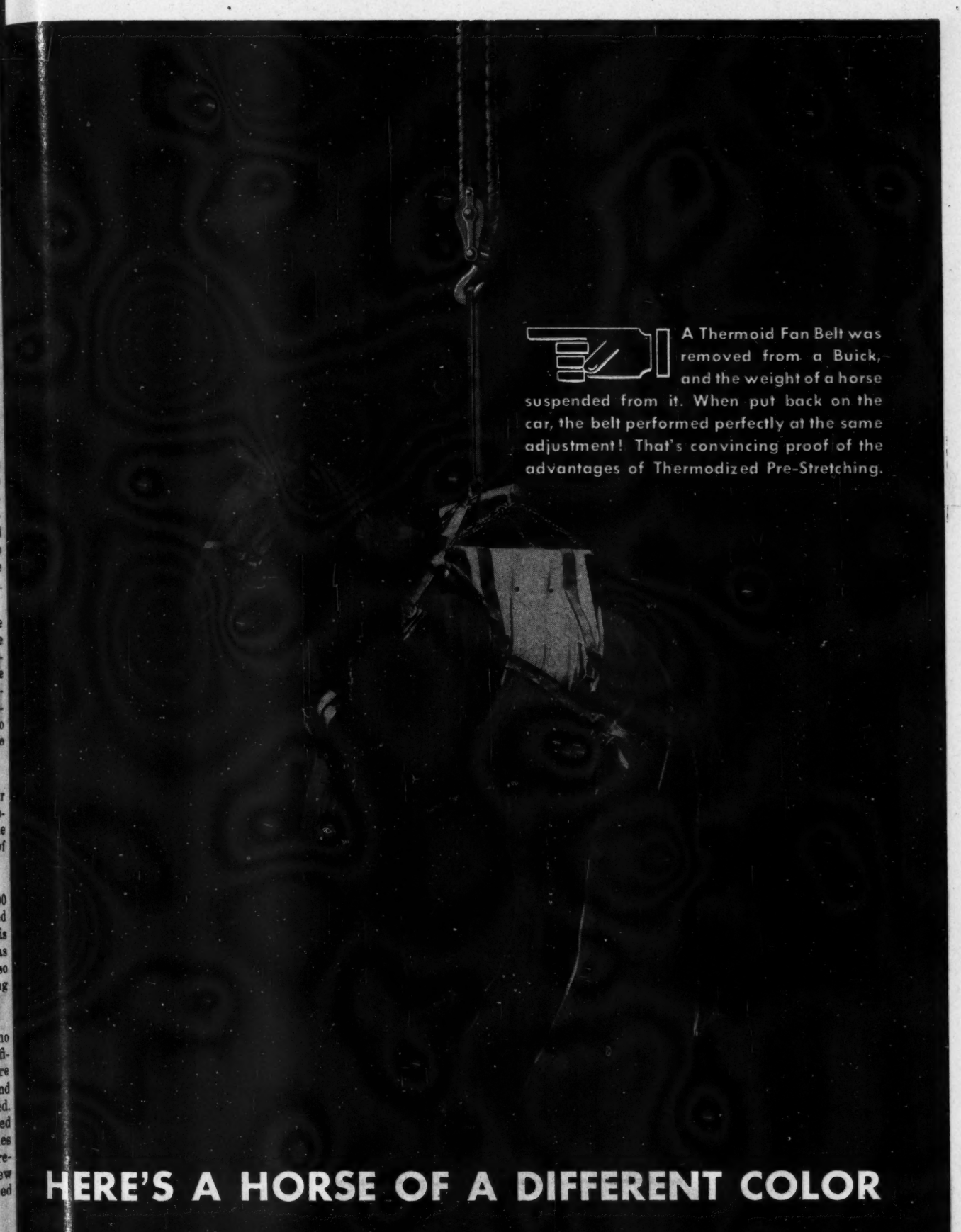
SOUND YOUR Z

100% Pure Pennsylvania

PENNZOIL

Safe Lubrication

THE PENNZOIL COMPANY
EXECUTIVE OFFICES
OIL CITY, PENNSYLVANIA


A Thermoid Fan Belt was removed from a Buick, and the weight of a horse suspended from it. When put back on the car, the belt performed perfectly at the same adjustment! That's convincing proof of the advantages of Thermodized Pre-Stretching.
HERE'S A HORSE OF A DIFFERENT COLOR

"Inlaid' Truck Tires

A major step has been taken in the improvement of synthetic-rubber truck tires through the development of a new type of tire-carcass construction, it has been announced by United States Rubber Co. More than a quarter of a million truck tires, embodying this new and scientific principle in tire building, have already been manufactured for the use of our military forces.

With greatest strain and heat in truck tires usually occurring in the carcass directly under the tread of the tire, the new construction, known as the inlaid carcass, places from 10 to 30 per cent of crude rubber in this critical region of the tire.

"It has been repeatedly demonstrated that where the same amount of rubber is used, the inlaid carcass clearly outperforms the conventional type of carcass," stated Dr. Sidney M. Cadwell, director of tire development. "And, where rayon cord is used, tests show that the synthetic carcass, inlaid with 30 per cent natural rubber is as good as the pre-war natural rubber cotton carcass, which was the pre-war standard construction."

BUILT RIGHT *Inside*
THAT'S AP ENGINEERED CONSTRUCTION

AP

Inside the shell of an AP Muffler—you'll find the right inner construction for ORIGINAL EQUIPMENT PERFORMANCE! AP ENGINEERED CONSTRUCTION assures each muffler correctly designed and correctly built ...with various models geared to the varied engine designs. The AP Parts Corporation, Toledo, Ohio.

MILEAGE GETTING
MUFFLERS

J. C. Hammond R. L. Anderson

Franklin Appoints 2

Franklin Transformer Manufacturing Co., Minneapolis, announces the appointment of R. L. Anderson as chief engineer. He is in charge of work on developments in Army and Navy equipment, including welders, transformers, crystals and other products.

The appointment of J. C. Hammond as vice president in charge of sales to supervise merchandising activities, also is announced.

Anderson has been associated with Franklin Transformer Co. since 1942. Previously he was associated with the Rockefeller Foundation at the University of Minnesota. He also served as research specialist for Columbia Broadcasting Co., and was later operating engineer for a station WCCO, Minneapolis.

Hammond was formerly with the National Battery Co., St. Paul, holding executive positions involving merchandising of storage batteries.

Elected to Board

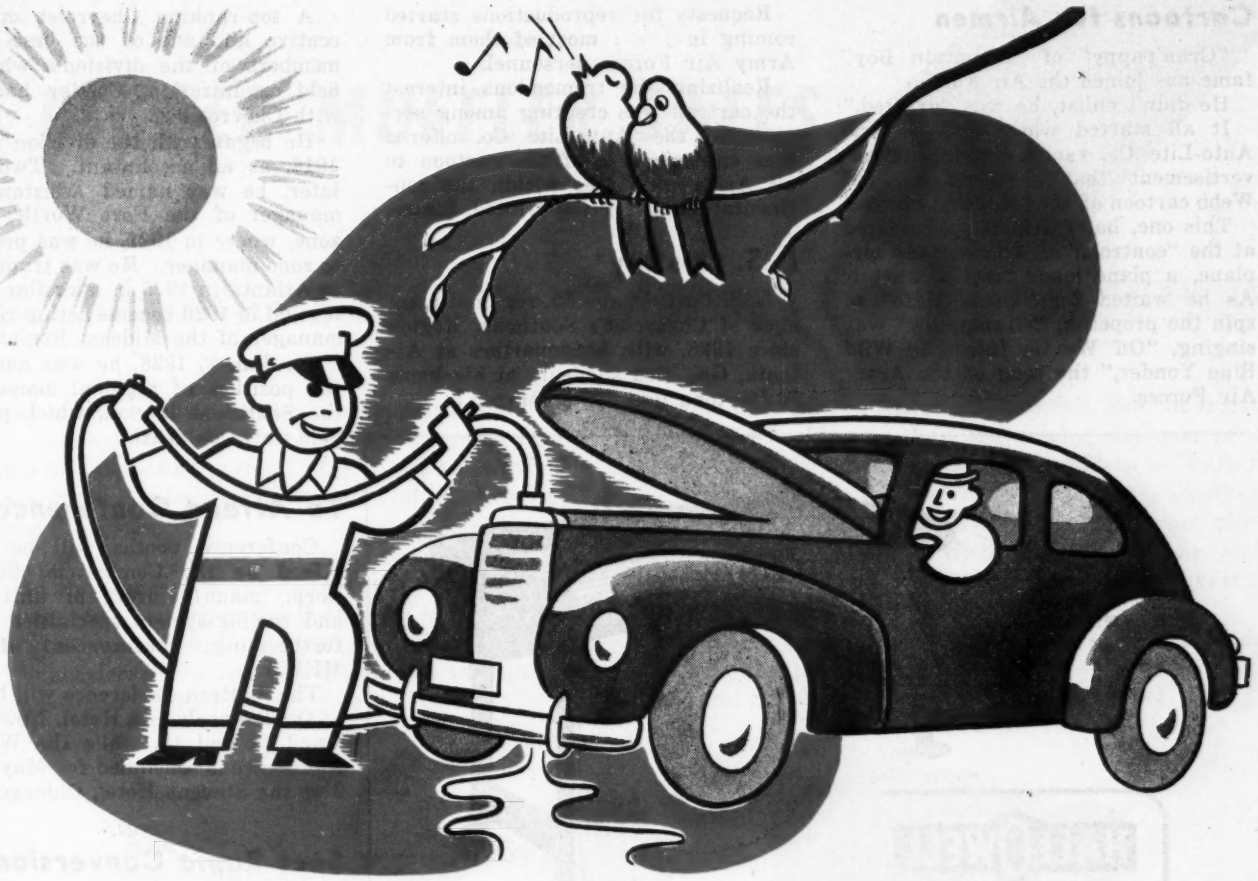
Ralph R. Layte, president, Purolator Products, Inc., Newark, N. J., announces the election of Clarence E. Searle to the board of directors. Searle is also vice president in charge of sales and member of the board of Worthington Pump & Machinery Corp., Harrison, N. J.

A native of Ansonia, Ohio, Searle, has been associated in the past with Wetsern Electric Co., General Electric Co. and Allis-Chalmers Mfg. Co. He has been with Worthington Pump & Machinery Corp. since February, 1932, and is now serving the War Production Board as an executive consultant on pumps and compressors to the Industrial Equipment Division.

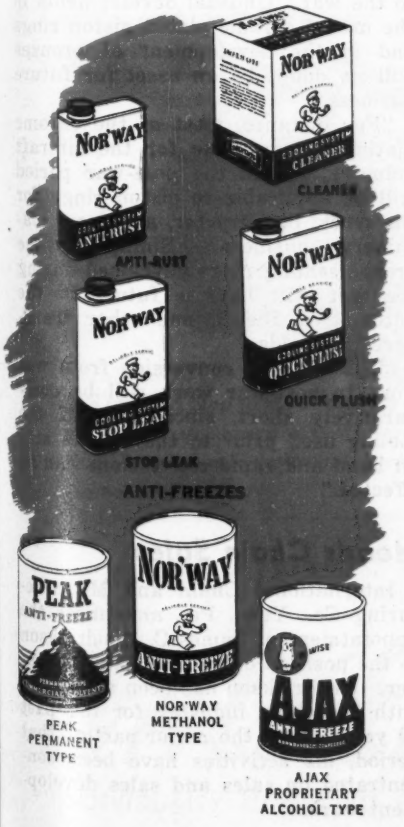
1943 Net Profit Higher

A net profit of $454,905.35, equal to $3.03 per share of stock outstanding, was reported by the Lynch Corp., Anderson, Ind., for the year ended Dec. 31, 1943. This compares with a net of $435,591.14, or $2.90 a share for the previous year.

Provision for federal income and excess profits taxes, renegotiation of war contracts, and contingencies amounted to $803,000 in 1943, compared with $396,416 the year before.



WHEN DRAINING ANTI-FREEZE, PREPARE FOR SUMMER HEAT!



FOR THE COOLING SYSTEM IS AS VITAL AS THE TIRES

When anti-freeze is drained—that's the time to prepare the cooling system for summer driving. Clean out rust, scale, and grease. Repair leaks. Prevent the formation of new rust. Check the water pump, fan belt, hose connections, gaskets, and other vital parts. Keep cars in service—and make the extra profits.

Sell and profit by CSC Complete Cooling System Service all the year 'round. CSC Complete Cooling System Service is advertised in Collier's, Time, and Newsweek. Ask your jobber.

COMMERCIAL SOLVENTS CORPORATION
17 East 42nd Street, New York 17, N. Y.

CSC

YEAR 'ROUND COOLING SYSTEM SERVICE

COMMERCIAL SOLVENTS *Corporation*

Cartoons for Airmen

"Gran'pappy" of "Mountain Boy" fame has joined the Air Force.

He didn't enlist, he was "drafted."

It all started when The Electric Auto-Lite Co. ran a spark-plug advertisement that featured a Paul Webb cartoon of the "Mountain Boys."

This one, had "Gran'pappy" seated at the "controls" of a homemade airplane, a plane made from a tractor. As he waited for "Uncle Rafe" to spin the propeller, "Gran'pappy" was singing, "Off We Go Into The Wild Blue Yonder," the song of the Army Air Forces.

Requests for reproductions started coming in . . . most of them from Army Air Forces personnel.

Realizing the tremendous interest the cartoon was creating among servicemen, the Auto-Lite Co. offered free enlargements of the cartoon to all Army air bases within the continental limits of the United States.

L. S. Costley

L. S. Costley, age 50, regional manager of Chevrolet's Southeast Region since 1928, with headquarters at Atlanta, Ga., died suddenly at his home in Daytona Beach, Fla. March 5.

A top-ranking Chevrolet sales executive and one of the best known members of the division's wholesale field organization, Costley had been with Chevrolet 28 years.

He began with the division Feb. 6, 1916, as an accountant. Two years later, he was named assistant zone manager of the Fort Worth (Tex.) zone, where in 1921, he was promoted to zone manager. He was transferred to Atlanta in 1925 in a similar capacity and in 1926 became acting regional manager of the Mideast Region.

On Jan. 2, 1928, he was named to the position of regional manager of the Southeast Region, which post he held until his death.

To Attend Conferences

Conference booths will be maintained by the Commercial Solvents Corp., manufacturers of anti-freeze and cooling-system specialties at the forthcoming conferences of the MEWA.

The Eastern conference will be held at the Pennsylvania Hotel, New York, April 17 and 18, while the Western conference is scheduled for May 8 and 9 at the Stevens Hotel, Chicago.

Sees Rapid Conversion

"The post-war outlook of American Hammered Piston Ring division of Koppers Co. is perhaps more encouraging than that of a number of other companies, since the same products are being manufactured in their expanded factories for war use as were made to a lesser extent prior to the war. Unusual developments in the use of chrome-plated piston rings and in the development of bronzes will no doubt be an asset for future business.

"For instance, most of the chrome plating is now done for the aircraft industry, but in the post-war period will be applicable to piston rings for the truck, bus, tractor, and farm machinery business. Similarly, the bronze sealing rings developed during the war will have a future in the automotive, Diesel, and other transportation fields.

"The time for conversion from war work to post-war work will be comparatively short, since most of the tooling used prior to the war is still on hand and rapid conversions can be effected."

Heads Chain Sales

International Chain and Manufacturing Co., York, Pa., announces the appointment of James C. Hendrickson to the position of general sales manager. Hendrickson has been associated with the chain industry for the past 20 years. For the major part of that period, his activities have been concentrated on sales and sales development work.

Fig. 928. Patd. & Pats. Pending. Drawer is extra.

HALLOWELL

SHOP EQUIPMENT

You can get it pronto

"HALLOWELL" WORK-BENCHES of STEEL are ready-made in such a variety of interchangeable combinations—over 1300! —that you can select from stock the benches best suited to your own particular requirements. You save time on installations, too, because these benches are of rigid construction and require no costly, time-consuming bolting to the floor.

Fig. 1972

Also included in the "Hallowell" line are FOREMEN'S DESKS and TOOL STANDS of STEEL. Desks are compact, fire resisting, with theft-proof drawers—handy for storing service sheets. Tool stands are made in a variety of models—open and closed—portable and stationary—all built along the same rugged lines as the benches.

For the duration, these "Hallowell" *items are all available in wood for use where the installation of steel equipment is war-restricted.*

THE "HALLOWELL" SEMI-PORTABLE WORK-BENCH of STEEL is ideal for use in the service or repair shop. Casters on two legs and wheelbarrow handles make it easy to move from job to job, yet it stands firm when placed and the handles, when not in use, fold out of the way.

Write for Illustrated Bulletins

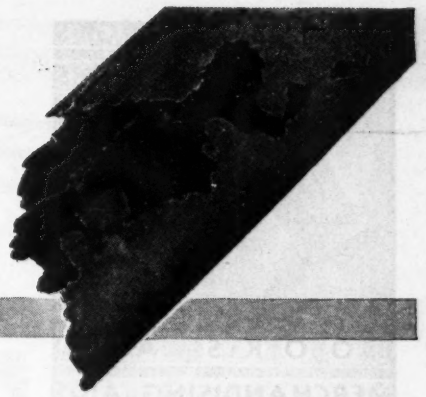
Fig. 992

STANDARD PRESSED STEEL CO.

JENKINTOWN, PENNA., BOX 561. BRANCHES: BOSTON • DETROIT INDIANAPOLIS • CHICAGO • ST. LOUIS • SAN FRANCISCO

Over 40 Years in Business

TO BIGGER MUFFLER SALES



Sh! Keep your eyes open for the "fingerprint" of muffler money . . . the new quick clue to increased muffler business—*the rusted-out end of a tail pipe.* It sticks out right under your nose on every car that comes on the driveway or service floor.

Here's the way it works! Tail pipes go first . . . so, if the *end* of the tail pipe is full of rust holes . . . battered . . . and ragged . . . *chances are the muffler is shot, too,* or almost. That's your clue to find out. Ask the customer to "kick the accelerator"—and you listen. Ten seconds are all it takes—and another muffler sale is started!

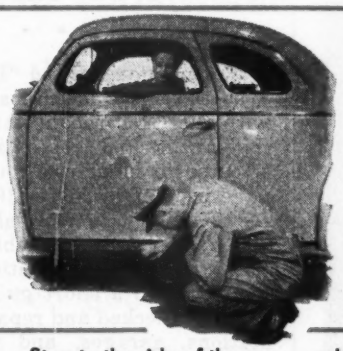
Stoop . . . Look . . . Listen . . . and Sell. Sell the finest replacement mufflers modern engineering has ever produced — the world's most popular mufflers — Walker Silencers with the "Louvered Tube." Only Walker Silencers are "Individually Tuned" to the exact performance requirements of each individual make and model of car—for peak engine performance and greater gasoline economy.

Watch for the "tail pipe clue." Get your Walker Silencer and pipe stock in order . . .

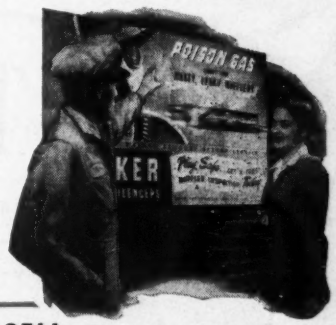
. . . and STOOP . . . LOOK . . . AND LISTEN!

STOOP . . . Whenever a car comes on the driveway or service floor—stoop down in back where the tail pipe extends out beneath the bumper.

LOOK . . . Look at the end of the tail pipe. If it's full of rust holes—battered and ragged—chances are the muffler is gone, too, or well on its way.



LISTEN . . . Step to the side of the car . . . ask the driver to kick the accelerator a few times with the engine running—and listen. If the muffler is rusted out—you'll hear the noise or rattles.



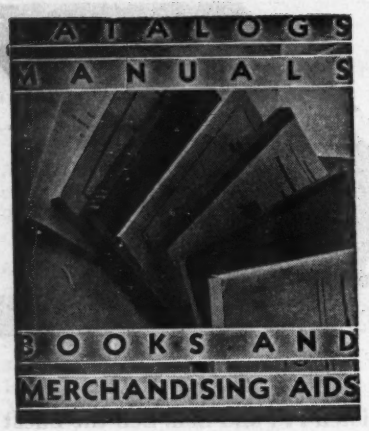
. . . AND SELL—Clinch the sale. Talk about the dangers of Carbon Monoxide. Tell about Walker "Individual Tuning"—Make a date to change the muffler and pipe—or to check the exhaust system.

WALKER MANUFACTURING COMPANY OF WISCONSIN, RACINE, WISCONSIN

Also makers of Walker Hydraulic and Mechanical Jacks . . . and Electric Lifts

WALKER SILENCERS WITH I.T.*

*"INDIVIDUALLY TUNED" TO EACH MAKE AND MODEL OF CAR—UNDER WARTIME DRIVING CONDITIONS



In the interests of better workmanship in recapping and repairing as an essential factor in the nation's tire-conservation program, a new booklet, "The Know How for Quality Recaps, Quality Repairs with Synthetic Rubber" has been issued by Gillett Tires.

Much of the material has been taken from the successful methods used at the company's repair school at Detroit, considered by experts to be a post-graduate course in tire-service engineering. The new Gillett Manual is recommended as a sound guide for the use of synthetic or natural rubber materials for repairing or recapping any type of tire or tube.

A free copy will be supplied on request to Gillett Tires, Division of United States Rubber Co., Rockefeller Center, New York, 20, N. Y.

* * *

A new wartime wall chart that tells how to use and conserve all makes of tire chains is being distributed by the Pyrene Manufacturing Co., Newark 8, N. J., makers of Pyrene tire chains.

This chart, designed for posting by automotive fleet operators and dealers, makes suggestions on four important points:

(1) Using chains when needed, (2) Installing chains properly, (3) Repairing chains promptly and (4) Conserving chains by good driving.

A sample copy of the chart will be sent on request to Pyrene, or a quantity will be supplied to fleet operators for posting in fleet garages and repair shops.

* * *

The ability to use manpower, machines and "plan power" effectively under the present pressure of war needs is the outstanding requirement of a good supervisor today. The booklet published by the Elliott Service Co. gives a foreman specific methods and concrete suggestions for utilizing not only the machines, manpower, and materials he has at hand, but also how to tap the idea resources of his workers and get their enthusiastic support for his efforts to increase production. It not only shows him how to plan his work, but also how to study his present job methods and develop better methods for doing each job. Published by Elliott Service Co., 219 E. 44th St., New York 17, N. Y.

* * *

A pamphlet entitled "Rehabilitation and Preventive Maintenance," dealing with the ODT rehabilitation program for trucks and buses, is being distributed to industry groups. The 13-page booklet discusses 1944 prospects for civilian commercial motor vehicles, the truck rehabilitation program, preventive operation and maintenance, and a short guide to having vehicles checked and repaired in filling stations, garages, and repair shops after 1,000 miles of operation. Copies may be obtained from the Office of Information, Office of Defense Transportation, Washington 25, D. C.

New Regional Manager

W. H. Stevens has been named regional manager of Studebaker's Cleveland branch, it was announced recently by vice-president K. B. Elliott. Stevens has been assistant regional manager of the corporation's South Bend branch. His promotion follows the resignation as Cleveland regional manager of F. A. Thomas, who has retired.

DODGE

for a Business Lifetime

You'll find plenty of dealers still very much on the job who started with Dodge more than a quarter of a century ago. ¶ You'll find them enthusiastic spokesmen for the policies of Dodge that saw them through the thick and thin of wartime and peacetime, boom and depression. ¶ None of them would trade the Dodge franchise for any other. They still consider it the biggest single opportunity in the automobile business. ¶ What is that opportunity? Well, it includes two popular cars, and a bang up job-rated truck. It's a single franchise that offers the maximum in service and sales opportunity, —in peacetimes and in wartimes. The proof is everywhere!

☆ ☆ ☆

DODGE • PLYMOUTH • DODGE Job-Rated TRUCKS

DODGE—DIVISION OF CHRYSLER CORPORATION, 7900 JOS. CAMPAU, DETROIT, MICH.

Baldwin Heads NAPA

Earl S. Baldwin, of Columbus, Ohio, was elected president of the National Automotive Parts Association at the annual meeting of the organization at Cincinnati, Ohio, Feb. 23, 24 and 25. Baldwin is president of the Automotive Parts Co., and had been vice-president of NAPA for the past two years.

F. E. Nolen, Colyear Motor Sales Co., Los Angeles, Cal., was named vice president, and Henry Lansdale was re-elected to the post of vice president and general manager.

Plans were completed for a series of one-day regional jobber meetings, devoted primarily to management problems, to be held in warehouse centers throughout the country.

The board of directors of the NAPA was increased from 9 to 13 members, and in addition to Baldwin, Lansdale and Nolen, the following directors were named: W. W. Martin, NAPA Pittsburgh Warehouse, Pittsburgh; A. F. Baxter, Unit Parts Corp., Buffalo, N. Y.; Carlyle Fraser, Genuine Parts Co., Atlanta, Ga.; R. W. Boozer, Boozer-Test Management Service, Indianapolis, Ind.; R. J. Harris, Standard Unit Parts Co., Minneapolis, Minn.; J. R. McCoy, Quaker City Motor Parts Co., Philadelphia, Pa.; J. H. Baldwin, Boozer-Test Management Service, Indianapolis, Ind.; B. W. Mendenhall, Mendenhall Auto Parts Co., Salt Lake City, Utah; R. L. Turner, Genuine Parts Co., Atlanta, Ga.; and H. A. Bradley, Jr., Quaker City Motor Parts Co., Philadelphia, Pa.

The NAPA Manufacturers' Council re-elected all officers for the ensuing year. C. Q. Smith, American Brakeblok Division of the American Brake Shoe Co., was named chairman; J. E. Echlin, Echlin Manufacturing Co., vice chairman; and H. D. Hubbs, Monmouth Products Co., secretary-treasurer. Other directors of the Manufacturers' Council are C. F. Conn, Trico Products Corp.; Dave A. Coulter, New Britain Machine Co.; W. M. Stuart, The Martin-Senour Co.; Lloyd Stowe, Raymond Manufacturing Co.; and Les A. Thayer, Belden Manufacturing Co.

WAR
GREATEST OF ALL PROVING GROUNDS
War tests the mettle of any product under rough, tough treatment on the home front as well as on the war front, yet U.S. equipment is taking everything in its stride on both fronts. U.S., like many other companies, has been unable to produce equipment for the trade due to our war work. However, thousands of U.S. Air Compressors, lifts and lubricating equipment are in daily operation and doing a very satisfactory job, despite hard usage and neglect due to help shortage. With U.S. it has always been a case of quality first, and the thousands of units now in operation are proof of what we mean by quality.
Keep your eye on U.S. after peace is declared—there will be something new and modern in automotive equipment.
U.S.
AIR COMPRESSOR CO.
5300 HARVARD AVENUE • CLEVELAND, OHIO
AIR COMPRESSORS • HYDRAULIC LIFTS
LUBRICATING EQUIPMENT

"Little Drip" Makes Bow

There's a brand-new, sprightly little trade character stepping forth in recent months from the advertising pages of automotive and industrial magazines. He's known as "Little Drip" and he is now found regularly in the advertisements of the Felt Products Mfg. Co., Chicago, makers of gaskets, packings and other sealing materials.

According to Byron J. Schwinn, manager of industrial and automotive replacements division, Felt Products officials had long felt that gaskets and packings were a prosaic subject, lacking in the human interest. To meet this situation, the company's advertising agency, Van Auken-Ragland, Inc., conceived and developed this trade character, the "Little Drip," to represent dramatically the conditions that the company's Fel-Pro gaskets and packings are designed to remedy. The "Little Drip" personifies drips or leaks, large or small —of water, oil, chemicals, gas, etc.— caused by improper sealing.

Heads Bearing Company

John K. Colgate has been elected president of Tyson Bearing Corp., Massillon, Ohio, succeeding Ralph Maxson, who resigned recently.

Colgate has been vice president and treasurer of the corporation for three years. In addition, he is a director of Colgate-Palmolive-Peet Co., director, treasurer and secretary of Van Strum & Towne, Inc., well-known New York investment counsel firm, and trustee of Colgate University.

The Tyson Bearing Corp. manufactures heavy-duty tapered roller bearings for automotive, industrial and farm implement use, as well as all bearings for military applications and precision parts for airplane engines.

Appointed Ad Manager

Julian A. Wesseler, manager of Commercial Solvents Specialties Division, announces the appointment of E. J. (Ned) Farrell as advertising manager for the Specialties Division with headquarters in the Commercial Solvents executive offices in New York. Farrell will supervise the activities of the Specialties Division in cooperation with John N. Cronk, the corporation's advertising manager in Terre Haute, Ind.

E. J. Farrell

Farrell has been associated with Commercial Solvents for the past 15 years — most recently as special assistant to the president. Before joining the Commercial Solvents organization, he was engaged in advertising work for a leading radio manufacturer, for the "Save the Surface" campaign of the paint and varnish industry, and for a prominent motor car manufacturer.

NSPA Holds Meetings

Through an extensive series of regional conferences, the National Standards Parts Association this spring will provide automotive aftermarket wholesalers and manufacturers with first-hand information on currently important wartime business regulations and will share with them the views and recommendations of industry leaders on subjects pertaining to production and distribution in the post-war era.

Eight meetings will be conducted in the West, Northwest and Southwest, according to C. D. McKim, NSPA executive vice president. The first was slated for Denver on March 14 at the Brown Palace Hotel.

The schedule for the first half of April calls for sessions at these points: Fort Worth, Tex., Hotel Texas, April 7; Houston, Tex., Rice Hotel, April 10; New Orleans, La., Roosevelt Hotel, April 12, and Memphis, Tenn., Hotel Peabody, April 14.

In this first portion of the spring conference series, the principal association speaker in each instance will be Jack Wiggins, assistant executive vice president, who has handled NSPA Washington activities for the past three years. Serving as chairman in each case will be a local member of the NSPA who will have the assistance of a regional attendance and program committee.

Gen. Young Heads ODT

Brig. Gen. Charles D. Young has been named acting director of the Office of Defense Transportation to serve until a successor to Joseph B. Eastman is named.

Eastman, who had headed the ODT since its creation soon after the United States entered the war, died March 15 at Washington. He had been a member of the Interstate Commerce Commission since 1919 and was chairman of that body from 1939 to 1942. He was one of the country's outstanding transportation experts.

General Young, who was placed in an inactive status after reaching the Army retirement age of 64, returned to ODT in July, 1942. In July last year he was named deputy director.

Except for his war assignments with the Army in two world wars, General Young has served since 1900 with the Pennsylvania Railroad. He became vice president in charge of purchases, stores, and insurance in 1942 and assumed the additional duties of vice president in charge of real estate and taxation in 1938.

When war began, he was called to active duty with the Army as chief of the Railway Section under the chief of engineers. It was from this position that he was appointed to his first post with the ODT as director of the Section of Materials and Equipment. He resigned in February, 1942, to return to the Army.

SAFETY and Tire Saving Speed Victory

Perfect brakes conserve tires, time and equipment.

As our mighty forces get set for the smash through to Victory, American Motor Transport must be kept fit to deliver the goods. *Never before has conservation and maintenance* of Cars, Trucks, Trailers and Buses *meant so much.*

We are proud of the aid GATKE Brake Lining gives *in this all important job—*

The smooth, *non-grabbing action adds countless miles* to tire life.

Dependable holding power at all service temperatures—quiet operation —and long wear life with fewer adjustments *assure user satisfaction and make friends for service men.*

GATKE Drilled Sets for more than 90% of vehicles *save application time.*

Tell-All Labels on each box give make, year and model of cars the set fits for *instant, positive identification.*

GATKE Simplified Catalogs make it easy to select the proper set quickly.

For other features that help render better service quicker, *ask your GATKE Jobber* or write.

Note the Tell-All Labels on GATKE Cartons.

Gatke CUSTOM-BILT BRAKE LININGS

BLOCKS SETS ROLLS SHEETS

GATKE CORPORATION 228 N. La Salle Chicago 1, Ill

MEWA Launches Ads

The Motor and Equipment Wholesalers Association is conducting a full-coverage trade-magazine advertising program to tell about outstanding wartime services of automotive wholesalers and to emphasize the importance of the wholesaler-dealer system of distribution in the efficient wartime functioning of America's millions of motor vehicles and to the maintenance of our country's free-enterprise system. Information concerning the program is given in a recent release which says:

"Pursuant to action by its board of directors, the Motor and Equipment Wholesalers Association is inaugurating the Automotive Wholesalers' Trade Magazine Advertising Program in the April and May issues of practically all automotive trade papers. The program is being financed out of general funds of the association and no assessments or contributions are asked for or contemplated. It is projected over a three-year period.

In a letter transmitting a booklet describing the automotive wholesalers' advertising program, MEWA urges all members to use direct mail pieces that tie-in with the trade paper advertising.

The association's advertising committee has charge of the MEWA Automotive Wholesalers' Advertising program and Van Auken-Ragland, Inc., Chicago, is the advertising agency executing it. The committee consists of Messrs. Carl J. Hendricks, Chairman, Motive Parts Co. of America, Inc., Chicago, A. X. Heller, The York Supply Co., Dayton, and E. J. McKee, The Sieg Co., Davenport.

This Russian scientist has just discovered how to keep *people* strong and active up to the age of 150 years.

YOU can lengthen the life of your *motors* and keep *them* peppy and powerful to a ripe old age by adding NU-POWER to your fuel regularly.

NU-POWER increases mileage, pep and power. It reduces knocks and "ping" and creates smoother operation. NU-POWER keeps motors cleaner and increases their operating efficiency.

Keep your motors young. Add NU-POWER every time you "fill up". It pays.

A tight motor is an efficient motor. **TiteSeal** prevents leaks of gases, liquids, and power from combustion chambers and at all other points. **TiteSeal** stays soft—allows easy disassembly—saves labor. Vibration proof. **TiteSeal** is the complete gasketing and sealing compound

SOLD ONLY THROUGH THE TRADE

RADIATOR SPECIALTY COMPANY
CHARLOTTE 1, NORTH CAROLINA
Branches • LOS ANGELES 1, CALIFORNIA • TORONTO 2, CANADA

AERA Meeting June 13-15

For the 22d consecutive year, members and guests of the Automotive Engine Rebuilders Association will assemble for the promotion and development of the automotive engine rebuilding business. The dates for this meeting are June 13, 14, and 15 and the place is Cincinnati, Ohio.

Conference booths, attractively decorated, will be available for the use of manufacturers and their jobbers and, as will be indicated on the printed program, special conference periods will be set aside from the program sessions. To accommodate a greater number of manufacturers this year, booth reservations will be limited to one space per manufacturer until after May 15 at which time any additional space open will be assigned to such manufacturers who desire it.

Executive Vice President R. G. Patterson announces the recent addition of 23 members to the roster of the association, 12 different states and Canada being represented. The membership is now the largest in the organization's history, and this recent increase in membership is indicative of the constant growth enjoyed by the association throughout its many years of existence.

Directs Service

Appointment of Myrle E. St. Aubin as director of the Service Section of the Distribution Staff of General Motors has been announced by Albert Bradley, executive vice president of the corporation.

Starting with General Motors in 1927 upon his graduation from the University of Michigan, St. Aubin joined the distribution staff in 1935 and three years later became its field observation representative to report dealer and customer reactions to Corporation sales and service policies.

Aide to Sales Chief

Selby F. Greer, formerly with the Borg-Warner Service Parts Co., has joined the Kellogg Division of the American Brake Shoe Company, Rochester, N. Y., as assistant general sales manager.

Greer brings to Kellogg 15 years' experience in the automotive service industry. He is well-known to jobbers, particularly in the New England and Pacific Coast states.

REO'S "BIG 7" DEALER PLAN
Questionnaire
SUCCESSFUL DEALER FRANCHISES ARE BUILT ON "7 PILLARS".
On each of the 7 points there must be thorough understanding and complete agreement by two parties—the factory and the dealer. Reo's "Big 7" Dealer Plan is a natural!
To be sure that it fits exactly the needs of the prospective dealer, Reo wants your help in shaping its program of tailored distribution. Below are the "Big 7". . . . What are your ideas on these subjects? Simply jot them down in the spaces provided on this sheet—attach a letter if you need more space—and mail to
REO MOTORS, INC. • LANSING 20, MICH.
1 TERRITORY

"THE $64.00 QUESTION"

ery dealer in the country is faced with the ques-n: "What kind of a franchise will I have in the stwar period . . . What are the "ground rules ing to be?"

o wants to set up a franchise that offers a new con-ption of money-making opportunities for dealers. at's why a Questionnaire has been prepared to simplify the process of getting your ideas on the 7 basic points in a factory-dealer relationship.

So drop us a line today. We'll get the Questionnaire off to you at once.

REO MOTORS, INC.
Lansing 20, Michigan

★ REO ★

America's Toughest Truck

Predicts Cheaper Tires

Post-war tires will be cheaper and better than pre-Pearl Harbor tires, largely as a result of the national synthetic-rubber program, James J. Newman, vice president of the B. F. Goodrich company, predicted at Greensboro, N. C., March 9.

"Continuous research and the accumulated manufacturing experience of the rubber industry are steadily raising the quality of tires and tubes made from synthetic rubber, and lowering the costs," Newman said. He indicated, however, that the rubber industry has no thought of abandoning natural rubber as its primary source of supply.

The rubber industry advocates, he said, continued production of synthetic rubber on a reduced scale after the war to "insure against another rubber emergency to enable research to be continued, and to keep down the cost of natural rubber."

"The cost of synthetic rubber will always serve as a ceiling over the price of natural rubber," the Goodrich executive explained, "and this will mean a saving of many millions of dollars to American tire users." He remarked that the price of natural rubber before the war was around 20 cents a pound whereas synthetic rubber has been produced in some instances as low as 15.

Heads Tool Co.

Neil C. Hurley was elected chairman of the directors of the Independent Pneumatic Tool Co., March 8, and Neil C. Hurley, Jr., was elected president at the company's annual meeting.

The younger Hurley has been associated with the firm for 12 years, following his graduation from Notre Dame. In recent years, following his management of the company's electric-tool division he has successively served as secretary, vice president and executive vice president.

Neil C. Hurley, Jr.

Edward G. Gustafson, treasurer of the company, and John McGuire, secretary, were elected to the board of directors.

At the same time the company announced a net profit for 1943 of $2,074,039 or $5.52 per share before deducting contingency reserves of $900,000 as compared with a net profit of $1,611,636 in 1942 or $4.29 per share before deducting a contingency reserve as compared with $5,023,55 in 1942.

Joins MEWA Staff

Millard F. Shryer, formerly sales manager of Motive Parts Co. of America, Inc., Chicago, and manager of the Wholesale Sales Department of the Wayne Pump Co., Fort Wayne, Ind., has joined the staff of Motor and Equipment Wholesalers Association as national field representative and secretary of committees, according to announcement by B. W. Ruark, general manager, at the association's national headquarters at Chicago.

Having filled responsible positions with one of the country's leading automotive wholesalers and with a principal manufacturer for over a period of 20 years or more, Shryer brings to his new post a record of successful experience and broad understanding of the automotive after-market industry.

Purchase Authorized

Stockholders of the Miller Manufacturing Co., makers of service tools for automobiles, airplanes and engines, authorized, at a special meeting at Detroit, March 10, the creation of an issue of 100,000 shares of $5 par convertible Class A stock, to be used in connection with the acquisition of a controlling interest in the Rieke Metal Products Corp., of Auburn, Ind., the nation's largest manufacturers of fittings for metal containers

Buy U.S. War Bonds

Roll On to Victory!

KEEPING them rolling is a job for compressed air... for tire filling, lifting, greasing ...saving precious manpower. Wayne Service on your present equipment is always available. Wayne Compressors are obtainable under Government regulation. Write for information and catalog showing complete line.

THE WAYNE PUMP CO., FORT WAYNE 4, IND.

Wayne AIR COMPRESSORS

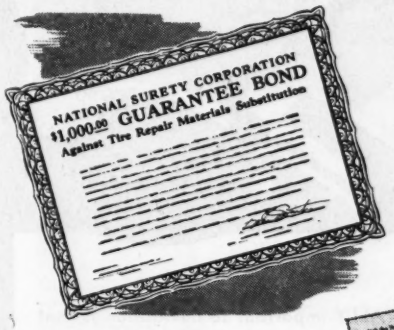
MAKE BIGGER TIRE-REPAIR PROFITS EASILY

with this New Inland Bonded-Dealer Plan!

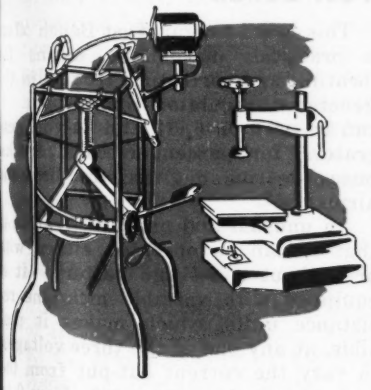
Clear $15.00 Profit a Day with Only 2½ Hours Work! Inland Equipment Pays for Itself in a Few Weeks!

Here's How the Inland Plan Builds Your Profits

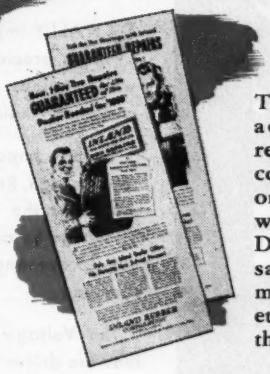
Inland bonds you for $1000—pays the entire cost! This bond sets you head and shoulders above competitors . . . enables you to reach out into the market and convince the most skeptical prospects that you're the man to entrust with their tire repairs. With this extraordinary sales-tool you can *guarantee every repair job for the life of the tire!* You risk nothing. Inland stands behind every guarantee you make!



This sign identifies you as the Inland Bonded Dealer... brings business right to your door. It tells your community that you are headquarters for Inland repairs—*guaranteed for the life of the tire!*



This is the new Inland Complete Tire Repair Unit that makes it possible for you to handle any tire up to 7.50 x 16, and give factory-perfect service in 24 hours! With only five 30-minute repair jobs a day, and an average $3 profit to each job, you can clear $15 profit in 2½ hours! That kind of business pays for the equipment in 2 weeks!



This is the big Inland national advertising campaign that reaches right down into your community and sells car-owners on the advantages of dealing with you—the Inland Bonded Dealer! You get plenty of FREE sales helps, too—newspaper mats, radio scripts, post cards, etc.—to tie your shop in with the national campaign.

Inland Equipment Proved Most Profitable by more than 5000 Dealers

You can't miss! The Inland Tire Repair Unit and vulcanizing materials have already been proved the most profitable equipment in the shop by more than 5000 dealers! And Inland is the only large manufacturer of both equipment and materials. Now, with the tremendous sales influence of the Inland Bonded Dealership, you can capitalize on the richest tire repair market in history! America's tires must have repairs to keep rolling! Don't delay. Today, mail the coupon below for complete information!

INLAND RUBBER CORPORATION

FIRST NATIONAL BANK BLDG., CHICAGO 3, ILLINOIS

Subsidiary of MINNESOTA MINING & MANUFACTURING COMPANY, ST. PAUL, MINN.

Inland Rubber Corporation
First National Bank Bldg.
Chicago 3, Illinois

Quick—tell me how I can get the Inland Bonded Dealership in my community!

Name.....

Address.....

City.....*State*.....

Joins Radiator Firm

R. P. Exten has joined the Young Radiator Co., of Racine, Wis., as executive assistant to the president, according to an announcement by Fred M. Young, president.

One of his recent accomplishments, and one which received considerable recognition at the time, was the invention and design of the first successful, lightweight, high-torque-capacity clutch for engaging the horizontal rotor of the autogiro.

In his new position, Exten will devote himself particularly to production matters, where his engineering and production experience will be a valuable asset both now and in the post-war reconversion period.

Earnings Show Increase

The Electric Storage Battery Co. and subsidiaries, with general offices in Philadelphia, report for the year ended Dec. 31, 1943, consolidated net income of $2,056,406 after all charges, including provision of $5,920,000 for federal, state and foreign income and excess profits taxes and provision for contingencies of $1,014,000. The net income is equal to $2.26 a share on 907,810 shares of capital stock in the hands of the public. For the ye ended Dec. 31, 1942, net inco amounted to $1,997,026 or $2.20 share.

The results of operations from w contracts for the year 1943 are su ject to renegotiation of profits, bu the report states, upon the basis the profits allowed on war contrac for the year 1942 it is the opini of the management that no provisi for renegotiation of profits is requir for the year 1943.

Opens 11th Plant

The National Battery Co.'s eleven plant, situated in Sioux City, Iow will begin production on April according to a recent announcem by H. J. McKay, vice president charge of operations.

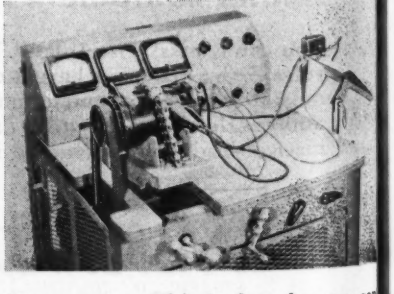
The new plant, which has 30,0 sq. ft. of floor space, will be devot exclusively to the manufacture farm storage batteries. This arrang ment will permit other National Ba tery plants to allocate their enti output to automotive and industri batteries for wartime and post-w needs.

In addition to Sioux City, the N tional Battery Co. has factories Atlanta, Chicago Heights, Dalla Depew, Leavenworth, Los Angele North Bergen, Rock Island, Sain Paul, and Zanesville.

Test Bench

This new Lanagan Test Bench offe a practical, dependable means f locating and correcting trouble in t generator, regulator, and cut-out. can be used on 6, 12 and 24-volt ge erators for passenger cars, truck buses, marine engines, tractors, a airplanes.

An unusual and practical feature that it can be operated either wi or without a storage battery. It equipped with variable nichrome r sistance units, which makes it po sible, at any one of the three voltage to vary the current out-put from t generator in 5 ampere steps from 0 t



60 amperes. This is done by one co trol in easily graduated steps. eliminates the necessity of taking t storage battery condition into co sideration when setting the regulato This makes possible the testing of generator without the regulato Manufactured by Lanagan & Hok Philadelphia 44, Pa.

Little Things
that do
A BIG
JOB
VITALLY important to navigation is that small precision instrument, the sextant, which guides a great ship safely on its course by indicating its exact latitude.
Equally important to a motor vehicle is the Voltage Regulator, an instrument that maintains the battery at the proper level of charge by controlling the generator output—preventing overcharging or undercharging.
The Voltage Regulator also sees to it that the driver has all the current he needs —within the capacity of the generator—at the time he needs it. In a word, it gives him assurance that every auxiliary unit operated by the electrical system will function continuously at all times.
For uninterrupted, dependable service replace with "Blue Streak," the Voltage Regulator that is built to high precision standards—and also built to "take it."
MOTOR STANDARD PRODUCTS
BLUE STREAK
STARTING, LIGHTING AND IGNITION PARTS
STANDARD MOTOR PRODUCTS, INC.
37-32 Northern Blvd., Long Island City, N. Y.
For "Long-Life Peak Performance" use Blue Streak Ignition Parts

"There's that darned squeak again."

Holds Sales Conference

Keen enthusiasm over the record of the past year and high confidence in the months ahead marked the recent two-day sales conference of Eastern and Southeastern Raybestos representatives held at Stratford, Conn.

Robert B. Davis, general manager, in opening the conference, cited impressive facts and figures of Raybestos achievements on the war and civilian fronts, and gave a detailed picture of Raybestos' plans for expansion and development in many markets, old and new. Davis stressed that Raybestos post-war planning is being translated into action now and that the company was in the enviable position of being able to convert almost overnight.

John S. Hopson

John S. Hopson, secretary treasurer of Hayes and Hopson, Inc., Asheville, N. C., died suddenly at his home at Asheville recently. Death was attributed to a heart attack.

In 1923 Hopson went into partnership with Max A. Hayes, establishing the firm of Hayes and Hopson which was incorporated as Hayes and Hopson, Inc., in 1929 and which under the direction of Hayes as president and Hopson as secretary treasurer has shown steady progress in the distribution of automotive products.

Named Sales Executive

David A. Wallace, president of the Chrysler Division, Chrysler Corp., announces the transfer of George Miller, budget supervisor, to the sales department, as sales executive and a member of the general sales staff of the division.

In his new position, Miller will continue some of the duties that he has been discharging and, in addition, will have charge of the budget direction of the division, labor problems involving the division and its branches, car distribution, sales agreements, sales tabulating and statistical operations.

Miller, in point of service, is one of the oldest men on the Chrysler roster, though now only 44 years of age, having served since Nov. 2, 1915, with this company and its two predecessors, the Chalmers Motor Co. and the Maxwell Motor Co. He applied for a job with Chalmers the day he first put on long trousers.

Marines Get Books

Many hundreds of books already have been shipped to Marines serving in the South Pacific in the "Books for Bougainville" campaign now underway at the Willys-Overland plant at Toledo, it is announced by Ward M. Canaday, president of the company.

The collection, according to Canaday, was undertaken by employes as a result of an S. O. S. for reading material sent them by one of their fellow workers now in service in the Pacific area.

bearings,
bearings,
EVERYWHERE
but
It's a fact—Bearings by the billion! And every one of them goes for war munitions, equipment and essential materiel.
We'd like nothing so well as to supply all the replacement bearings you need—but that is out of the question, for the present at least.
BUT—please do this without fail!
SAVE ALL WORN BALL BEARINGS
—NEVER THROW THEM AWAY!
They can be reground the Ahlberg way then fitted with oversize balls and new retainers—making them precisely "as good as new".
Supply houses in most principal cities carry Ahlberg Ground Bearings in stock for replacements. Ahlberg Jobbers can give you full details about reprocessing worn bearings, as well as worthwhile suggestions on how to make bearings last longer.
If you have not had a copy of the new book describing Ahlberg Ground Bearings, send for it at once, the AGB Book.
AHLBERG
BEARING COMPANY
Manufacturers of CJB Master Ball Bearings
★ 3028 WEST 47th STREET • CHICAGO, ILL. ★

Takes New Territory

The appointment of Bill Lindseth as sales representative in the Minneapolis territory, which includes Minnesota, North Dakota, South Dakota, part of Iowa and part of Wisconsin, has been announced by John Gallagher, sales manager of The AP Parts Corp., Toledo, Ohio.

This company manufactures a complete line of mufflers, exhaust pipes and tail pipes for passenger cars, trucks, and buses.

A factory-owned and operated warehouse for AP mufflers, exhaust pipes and tail pipes has been opened at 631-35 North 19th St., Philadelphia, Pa., Gallagher also announced. Ed Berdan is in charge of the warehouse.

Maintenance Show Held

Several thousand operators and maintenance men visited the Truck Maintenance Show, March 10 and 11, at Los Angeles. The Los Angeles Automotive Council, in cooperation with the ODT, sponsored the event, which this year replaced the annual new equipment show.

The purpose of the show, according to Ray Sanders, Turco Products, Inc., president of the council, was to pool the experience and knowledge gained by truckers and truck suppliers during the past year.

How these men have managed to keep their fleets moving night and day, carrying greater loads than ever before, meeting wartime schedules without replacements is a dramatic story. In 63 separate booths featuring new and improved maintenance methods and materials, some of the highlights of this story were presented, Sanders said.

Sales and Ad Men Move Up

Several promotions of sales and advertising personnel of the Pyrene Manufacturing Co., Newark, N. J., manufacturers of fire extinguishers and tire chains, have been announced, effective March 1, by George H. Boucher, general sales manager.

Nelson Bauer, Newark district manager since 1929, becomes assistant general sales manager. Bauer joined Pyrene's research department in 1922, later served as production superintendent of the company's tire chain plant and entered the sales department in 1928.

Raymond F. Poole, assistant district manager at Chicago, moves to Newark at district manager.

Frank R. Kachel, a Pyrene sales representative in Chicago since 1938, has been appointed assistant district manager to succeed Poole.

Truman Young, assistant advertising manager, assumes the responsibilities of advertising manager. Young joined Pyrene in 1933.

Acquires Timberland

Clarence P. Bowers, president of the Bowers Battery and Spark Plug Co., Reading, Pa., announced upon his return from the company's lumber mills at Grants Pass, Ore., that an additional tract of timberland had been acquired.

The timberland originally purchased contained Port Oxford cedar which has been frozen by the WPB and may be used only in batteries for government orders. The new tract of timber just acquired consists of fir which is now being used by battery manufacturers for civilian use.

Net Earnings Down

The Wickwire Spencer Steel Co. has announced that net earnings for 1943 amounted to $1,516,613.00 or $3.30 per share on 459,316 shares of common stock. Comparative net earnings in 1942 were $1,599,004.00 or $3.48 per share on the same number of shares.

The decrease in earnings is considered slight in view of greatly increased operating costs, particularly in connection with labor.

IT'S TIME FOR THOSE CARS TO HAVE A 'PHYSICAL'

With the supply of parts and service facilities far below the demand, it doesn't pay to guess at the condition of any car today. A thorough check-up now can save a lot of trouble. If it is overheating, knocking, wasting gas, oil and power . . . all these conditions might be due merely to a rusted, muck-choked *cooling system*. As you know, these symptoms are often mistaken for defects in the carburetor, lubrication or ignition system or faulty compression. The remedy is simple and inexpensive.

Check the cooling system . . . if it needs attention . . . suggest, *first*, cleaning it thoroughly to remove rust, scale and oil muck, and to restore free circulation. After removing anti-freeze, this should always be done immediately.

Second, suggest an inhibiter to prevent further rusting and to guard the metals against injurious chemical action from water. Recommend WARNER RADIATOR CLEANER for the cleaning job and WARNER COOLING SYSTEM PROTECTOR as the inhibiter. Thousands of service men consider WARNER Products the standard of protection.

And . . . don't overlook those sales to owners who prefer to perform this job themselves. But see that it gets done . . . keep those cars rolling.

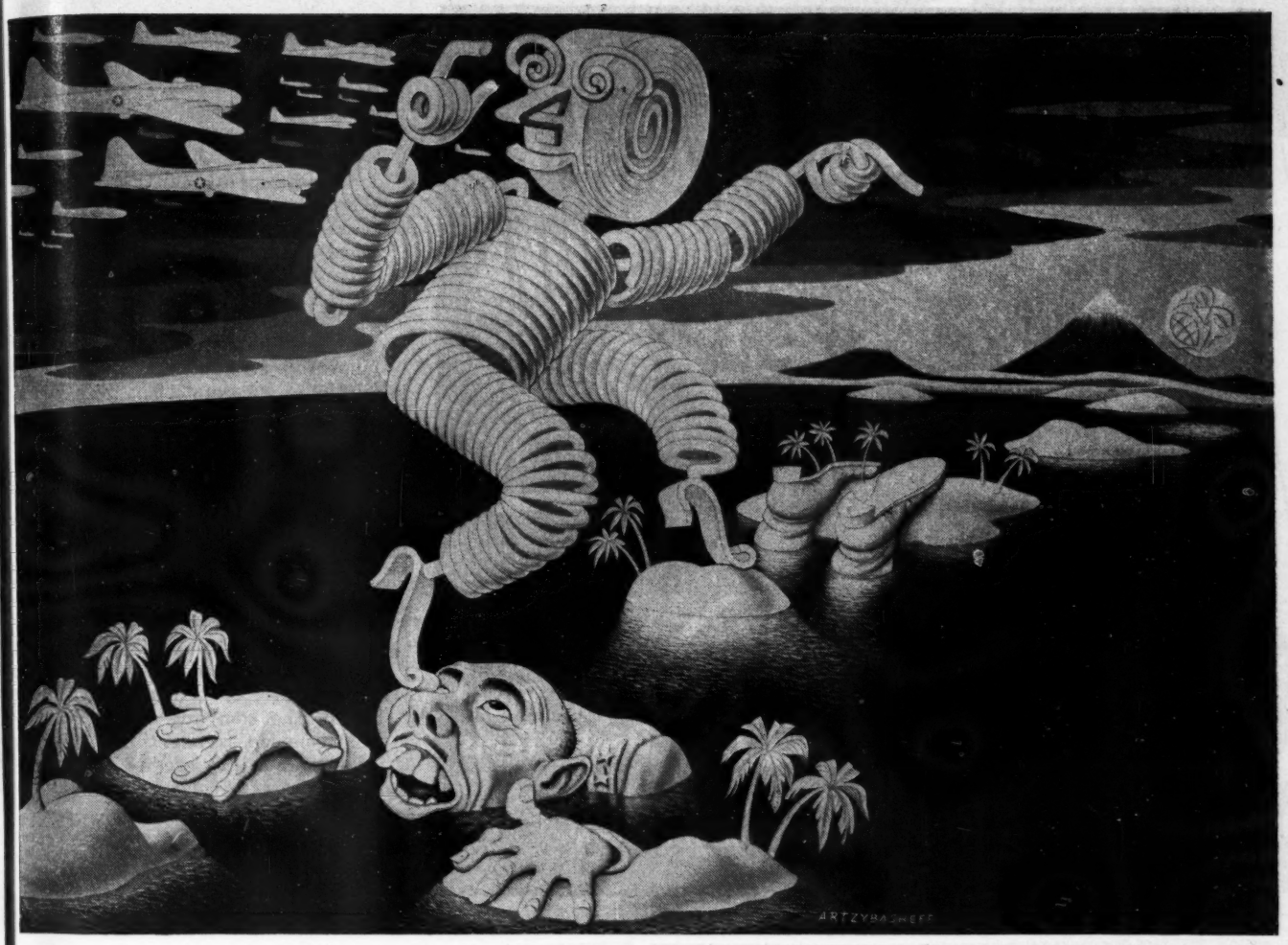
WARNER SERVICE CLEANER
. . . extra strength for trucks . . . heavy motors or badly neglected cars. Fast, non-poisonous.

WARNER LIQUID SOLDER
Repairs leaks in any part of cooling system quickly, permanently without mechanical aid.

Wartime demand makes it impossible to provide you with all the WARNER COOLING SYSTEM COMPOUNDS *you need. Please be patient.*

WARNER-PATTERSON COMPANY, 920 S. MICHIGAN AVE., CHICAGO 5, ILL.

WARNER
COOLING SYSTEM
COMPOUNDS
STANDARD OF PROTECTION



Enlarged reproduction free on request

Spring Offensive

In the island-hopping offensive toward Tokio, Wickwire Spencer steel springs are playing an unobtrusive but vital role. They're helping deal out punishment in guns, tanks, planes, torpedoes and other weapons of war.

Here at home, tough, dependable Wickwire valve, starter and clutch springs and other Wissco Automotive Products are helping men keep cars, trucks and tractors rolling—speeding supplies to our fighting forces and speeding the day when we can get back to peacetime pursuits.

Write for our latest Automotive Products catalog with complete installation guide for all cars, trucks and tractors. Address Wickwire Spencer Steel Company, 500 Fifth Avenue, New York 18, N. Y. or 101 Townsend St., San Francisco 7, Cal.

WICKWIRE SPENCER

AUTOMOTIVE PRODUCTS

STANDS FOR FRIENDLINESS

Copyright 1944, Wickwire Spencer Steel Co

Aide To Sales Chief

Announcement of the promotion of Howard Lang to the position of assistant sales manager of The Toledo Steel Products Co., Toledo, Ohio, has been made by J. E. Adams, vice president and general manager.

Lang has been with Toledo for 13½ years. For the past two and one-half years he has been supervisor of customer relations. Prior to that he was district manager for the company in an Eastern territory.

He is succeeded by J. W. "Bill" Jasperson as supervisor of customer relations. Jasperson has been a member of the Toledo sales office staff for several years serving in various capacities.

Reports 6 Months' Net

Estimated net earnings of $836,176.37 are reported by the Motor Wheel Corp. for the six months ended Dec. 31, 1943. Although the net earnings reported are still subject to review by the Price Adjustment Board, the company during the six-month period "renegotiated itself" by issuing voluntary credits against billings on war contracts of $1,820,870.65.

Gross earnings for the half year were $4,338,684.15 and provision for federal taxes $3,052,507.78.

Maintenance Short Cuts
FOR SERVICE SHOPS

How To Do FOUR Cleaning Jobs With ONE Oakite Material

Cleaning cooling systems SAFELY, degreasing repair parts FASTER, cleaning motors and chassis THOROUGHLY by steam-detergent method, washing floors and work pits at LESS COST . . . ALL FOUR jobs can now be satisfactorily handled with ONE cleaning material . . . OAKITE PENETRANT!

NEW, 12-Page Booklet FREE!

Because of its remarkable penetrating and solvent degreasing action, this four-purpose automotive maintenance detergent makes quick work of removing oil, grease and other deposits. Water-soluble, it creates no fire hazard. Easy to use, safe to handle. Try Oakite Penetrant . . . and see for yourself how it can not only help you turn out more maintenance work in less time, with curtailed man-power, but economize as well! NEW, 12-page booklet giving directions FREE! Write for YOUR copy TODAY!

OAKITE PRODUCTS, INC., 24C Thames Street, NEW YORK 6, N. Y.
Technical Service Representatives in All Principal Cities of the United States and Canada

OAKITE MATERIALS METHODS SERVICE — Buy Bonds for Victory — CLEANING FOR EVERY CLEANING REQUIREMENT

LION

DEPENDABLE AUTOMOTIVE PRODUCTS

Mr. Parts Jobber:
DO YOU KNOW
That NOW-More Than Ever Before
IT PAYS TO LINE UP WITH LION!

LION AUTO PARTS & MFG. CO., INC.
2214-20 Main St., DALLAS · 1920 S. Michigan Ave., CHICAGO · 1239 Osborne St., MONTREAL

Here's the WRENCH for the HARD-TO-GET-AT Spots

BEALL

SPEED-RATCH

removes or tightens nuts in a jiffy

BEALL SPEED-RATCH is the new, improved ratchet wrench with patented pull-chain in handle. Quickly and easily tightens or removes nuts at the hard-to-get-at spots—EVEN AROUND CORNERS—without finger manipulation or removing socket from the nut.

Use SPEED-RATCH as an ordinary ratchet wrench to "unfreeze" the nut then pull the chain to whirl the nut off the bolt. That's ZIP-ACTION—and it *makes your job easier* and saves time, too. List price, only **$6.00**

ASK YOUR JOBBER —*for a demonstration or write us for full information.*

MANUFACTURED AND GUARANTEED BY

BEALL TOOL COMPANY

Division of HUBBARD & COMPANY — EAST ALTON, ILLINOIS

PROOF...

That you can . . . GIVE YOUR TRADE WHAT IT WANTS and NEEDS **TODAY** . . . and MAKE MUCH NEEDED SALES and PROFITS DOING IT . . .

PROOF...

That . . . THE NEW OILDEX and FILTREX, SAVE GAS, OIL, REPAIRS and MAINTENANCE ON CARS and TRUCKS . . . Simple Installation . . . Big Replacement Market.

DISTRIBUTORS

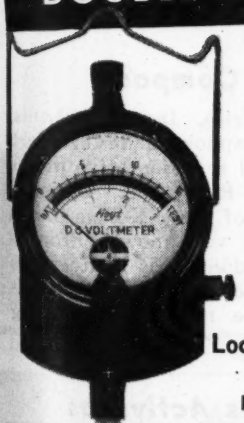
Models for all makes of cars, trucks . . . NOW READY FOR DELIVERY. WRITE for territory and profitable distributors proposition.

WRITE OR WIRE TO-DAY FOR FULL DETAILS

MOTOR ECONOMY PRODUCTS INC.

407 W. 36TH ST., NEW YORK, 18, N.Y.

CABLE AND BATTERY TESTER
DOUBLE-SCALE VOLTMETER



TESTS

All Battery & Ground Cables
•
6 Volt & 12 Volt Batteries & Individual Cells
•
Car & Truck Generators
•
Voltage Regulators
•
Lamp Voltage • Lamp and Horn Relays & Wiring
•
Location of Electrical Leaks

Ask your Jobber about Hoyt 606 Voltmeter TODAY

Our Armed Forces require testing instruments to keep the ignition systems of mechanized fighting units in condition and action. So, we know you realize that primary demand keeps our available supply for you down. Yet, by working 'round the clock, we are managing to keep your Jobber supplied with a reasonable stock of HOYT Instruments to enable you to test and keep vital home front ignition systems going. The HOYT Voltmeter shown is an example. Ask your Jobber to show you how to follow PD1A procedure so you can get it today.

BURTON-ROGERS CO.

857 BOYLSTON STREET—BOSTON, MASS.

NIEHOFF REBUILDING SERVICE

On Ford V-8 Distributor Housings And 3-Unit Type Voltage Regulators

★ *QUALITY WORKMANSHIP*

Write for full details on our Exchange Program

RETURN TO YOUR JOBBER OR TO US the above parts to be reconditioned and help your Government salvage critical materials in the interest of maintaining essential transportation during the emergency.

REBUILDING DIVISION

C. E. NIEHOFF & CO. 4925 LAWRENCE AVE., CHICAGO 30, ILL.

BRANCH: 1342 S. Flower St., Los Angeles 15, Calif.

Hurricane Bill says-

"WASHING A CAR IN HALF THE TIME MEANS TWICE THE PROFIT"

● Why lose money on car washing when you can turn it into a profitable operation? And with the modern Shampoo method you can turn out cleaner and brighter wash jobs for greater customer satisfaction.

USE

HURRICANE Auto Shampoo

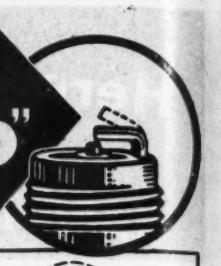
The fast easy car wash endorsed by leading national automobile, tire and oil companies. It produces a wash job that lasts longer, gives a high luster—drains quickly—leaves no streaks.

Send for FREE Sample
(Enough for Four Washes)
And FREE 8-Page Booklet
On Modern Method of Car Washing

Order From Your
Local Jobber or Distributor

LAKESIDE PRODUCTS
343 SOUTH DEARBORN
CHICAGO 4, ILLINOIS

Put an End to "GAP S-P-R-E-A-D"



REPLACE with Leonards and give your customers a spark plug that practically eliminates "gap spread" or widening between firing points.

Leonard special construction holds the original gap setting longer than any other plug. The gap can't change even if the ground wire moves (see large illustration).

Top performance assured, including heavy duty installations. Great for trucks—eliminates missing on a hard pull. On Chevrolets stops low speed "buck" and high speed "miss."

Write for new "Duration" Catalog

LEONARD SPARK PLUG CO., INC.
NEWARK, N. J.

TOP PICTURE: Dotted line shows how electrodes of conventional plugs become separated through heat expansion.

LOWER: Leonard side-spaced electrodes maintain their original spacing — even if ground wire moves in vertical direction.

PATENTED LEONARD Air Cooled SPARK PLUGS

CLASSIFIED ADVERTISEMENTS

FOR SALE, Act. & Ox. welding and cutting outfits. Also extra hose. No priority required. Van Dam Iron Works, 343 La Grave Ave. S. E., Grand Rapids 3, Mich.

WANTED

Major oil company wants man with personnel and industrial relations experience for permanent position of Supervisory Training Conference Leader in Midwest. State age, experience, education, draft status. Those in essential industry need not apply. Availability certificate required. Box 14, Motor Age, 56th & Chestnut Streets, Philadelphia 39, Pa.

AUTO MECHANICS: PROVEN NEW ONE-MINUTE METHOD TO REMOVE ALUMINUM HEAD FROM FORD MOTORS WITHOUT TOOLS. FULL INSTRUCTIONS, $1.00. WALTHAM TIRE EXCHANGE, 614 MOODY STREET, WALTHAM, MASS.

WANTED—BATTERY SALES ENGINEER

Large national manufacturer of battery parts wants capable man experienced in manufacturing, use and distribution of automotive and domestic replacement batteries. Our business is primarily war now. This would be essential war job with great prospects for post-war. Give us usual personal data, outline of experience, draft status, salary required. Address Box 13, Motor Age, Chestnut & 56th Streets, Philadelphia 39, Pa.

Canadian Firm Named

All Arrow Safety Device Co. business in Canada will now be handled by J. C. Adams Co., Limited, 115 George St., Toronto. This concern is well-known throughout Canada as distributor of automotive and industrial supplies. Adams, on a recent visit to Arrow's Mount Holly, N. J., offices, was enthusiastic about plans for Arrow merchandising in Canada.

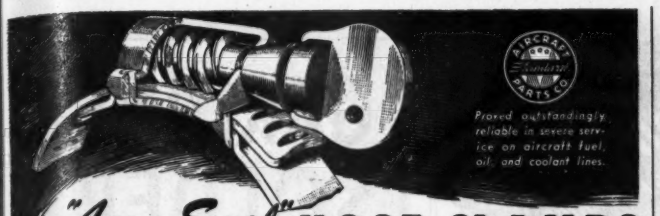
Joins Ring Company

Moog Industries, Inc., St. Louis, announce the appointment of Herb Wood as special representative of the Moog Piston Ring Co., Division, manufacturers of Moog X-Plus piston rings. Wood is well-known throughout the South, due to his many years with the automotive industry and his wide experience in the piston ring business.

Heads Sales Activities

The S. K. Wellman Co., Cleveland, Ohio, manufacturers of Velvetouch bimetallic friction materials, has just announced the appointment of Malcolm S. Adler as automotive division manager, with headquarters at Detroit. He succeeds John H. Dedrick, Jr., who is now engaged in special powder metallurgy research for the Wellman organization.

In his new position, Adler will be the coordinating head of all sales activities pertaining to the use of Velvetouch bimetallic clutch facings and brake linings in the automotive industry.



"Aero-Seal" HOSE CLAMPS

Distinctive worm gear tightening action provides powerful belt-like pull-up. Uniform pressure all around prevents leaks. Can be put on or taken off hose in place on pipe. Can be re-used. No loose parts. Compact design. Extremely long take-up. Made in sizes from ½" up. *Write for circular.*

Aircraft Standard Parts Co.

1709 D NINETEENTH AVE., ROCKFORD, ILL.

NEW! A "ONE MAN" Toe-In Measuring Gauge!

$5.95

Only 10 inches Long

Quicker and Easier to Use!

The Micro-Linor Toe-In Measuring Gauge requires only one man to operate it. Just attach the grippers to the rims and take front reading. Then roll vehicle forward and take rear reading.

Quicker — because gauge remains in same spot for both readings. All done in less than 2 minutes. Simple. Extremely accurate. Fits any vehicle. Every mechanic should own one.

Micro-Linor Service Corporation
1623 W. Fort St. Detroit 16, Mich.

WRITE FOR CATALOG

The Post Office Requests

— that you include *your Postal Zone Number* in the signature of all your advertisements, if you are in a city or town that has been zoned.

This will help speed delivery of inquiries addressed to you from the readers of—

MOTOR AGE

FIRST IN IMPORTANCE—CAR DEALER AND INDEPENDENT

A CHILTON Publication

Chestnut & 56th Sts. Philadelphia 39, Pa.

The Cure FOR SPOTTY TIRE WEAR

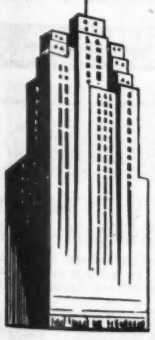
When tires show wear in spots, it's a sign that the wheel assembly is heavier at the places where the spotty wear occurs. The remedy is to balance the wheels with L & H Weights. This is a service that you can profitably sell to customers who are anxious to save their tires.

SEND
for wall chart showing how unbalance wears out tires.

HARLEY C. LONEY CO.
16893 Wyoming Detroit 21, Mich.

L&H Wheel Balancing Weights

MOTOR HEADQUARTERS



IN NEW YORK

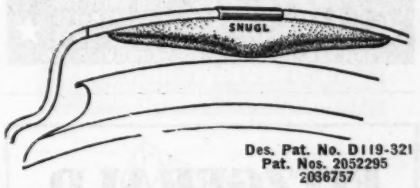
1 block from Automobile Row, this modern 700 room hotel is a favorite stopping place for members of your industry.

Single $3.00
Double $4.00

Hotel
WELLINGTON
7th Avenue at 55th Street
A Knott Hotel

. . . AND RECAPS WILL LAST LONGER, TOO

No matter how essential your customer may think the use of his car is, he may not be able to get new tires in 1944.



Des. Pat. No. D119-321
Pat. Nos. 2052295
2036757

The best he can do is recaps. Show him how he can get many more miles out of them by balancing each wheel with SNUGL Fade-away BALANCE WEIGHTS. Snugls are easy to install and stay put. They cannot work loose or rattle because of the self-locking dove-tail clip that grips, steel against steel, on each side of the rim flange. Sizes ½ oz. to 6 oz. for passenger cars—4 oz. to 1½ lbs. for trucks, buses, etc. Contact your Jobber today or write us direct.

Manufactured by
MID-WESTERN AUTO PARTS, 824 E. Elm St., Kokomo, Ind.
Western Distributor: Kenneth V. Mills, 910 W. Pico Blvd., Los Angeles, Cal.

Checks rear wheels as well as front.

Are You Mistreating Your SYNTHETIC TIRES?

The answer is almost bound to be "Yes", unless you have corrected the chassis defects which prevent the wheels from rolling true. An easy way to locate these mechanical troubles is outlined in our new circular "How to Lend a Helping Hand to Synthetic Tires." Send for it today.

Micro-Linor Service Corporation
1635 West Fort Street
Detroit 16, Mich.

WRITE FOR CATALOG

MICRO-LINOR
Patented "Tracer-Wheel" Principle

Flex-Stone

CONTACT POINT DRESSER
smooths hardest tungsten and platinum-iridium points.

YOU CAN BEND AND TWIST IT!

DRESSES and cleans all electrical parts and contacts, including commutators, spark plug points, etc. Very thin. When used on spark plugs will not cause widening or distortion of gap. "Cuts" and smooths hardest of metals. Flexible—works in confined spaces. Won't break when bent and twisted. No short circuit. Size 4¼" x ⅜". List 15c each. Ask your Jobber for Rimac Flex-Stone.

RINCK-McILWAINE, Inc., 16 HUDSON ST., NEW YORK 13, N. Y.

The Standard OF BATTERY TESTING INSTRUMENTS

Edelmann

No. 40 and 55 Thermo "Break-Not" Hydrometers

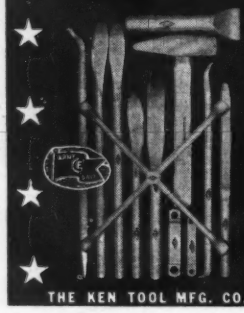
Most dependable and accurate. Over 500,000 in service. Tests storage batteries in cars or on the line. No. 55 especially designed for use in conjunction with Rapid Battery Chargers.

YOUR JOBBER WILL QUOTE PRICES

E. EDELMANN & CO.
CHICAGO • ILLINOIS

KEN-TIRE TOOLS

KEEP AMERICA'S KEY TRANSPORTATION ROLLING!



KEN TIRE TOOLS

REG. U. S. PATENT OFFICE

SEE YOUR LOCAL JOBBER OR WRITE FOR ILLUSTRATED LITERATURE

THE KEN TOOL MFG. CO. AKRON, OHIO

FITZGERALD
GASKET CRAFTSMEN SINCE 1906
GASKETS

The complete line that completely satisfies

The Fitzgerald Manufacturing Company
Torrington, Conn.

BALDOR

BATTERY CHARGERS
BATTERY TESTERS
SHOP GRINDERS
ELECTRIC MOTORS

Thomas Heads Dealers

Henry C. Thomas, head of Thomas Auto Co., was elected president March 13 of the Little Rock Automobile Dealers Association. M. S. Benson, of Rebsemen Motors, was elected vice president. Link Lewis was named secretary-treasurer. Lewis is also secretary of the state association.

Robert W. Graves

Unit Parts Corp. announces the death on March 4 of Robert W. Graves, sales manager of the corporation. Graves was 46. He had suffered for several years from a serious heart condition, which became critical in the summer of 1943.

Graves had been with Unit Parts Corp. since 1931, first as salesman, then field executive in charge of wholesale distribution, and sales manager for several years.

Carlton Named Chairman

C. C. Carlton, of the Motor Wheel Corp., Lansing, Mich., has been elected chairman of the recently appointed advisory committee representing the automotive parts industry, the OPA has announced. M. D. Douglas, of the Chevrolet Motor Division, was named vice chairman, and C. O. Skinner, of the Auto and Aviation Parts Manufacturers, Inc., was elected secretary.

Army-Navy "E" Awards

Lempo Products, Cleveland, Ohio. (Star.)

Heller Brothers Co., Newcomerstown, Ohio. (Star.)

ZECOL Inc.
Sole Manufacturers
Milwaukee, Wis.

GARDINER SOLDERS

Now Serving the Firing Line

Due to war needs, materials essential to a dependable solder for utility purposes just isn't available for civilian use. Therefore, until Uncle Sam says OK, we are only able to supply our Jobbers and Dealers with Gardiner Quality Solders to a limited extent.

Gardiner METAL CO.

4839 S. CAMPBELL AVE., CHICAGO, ILL.

BUELL AIR HORNS

AVAILABLE ON PRIORITY

Manufacturers of High Pressure Air Horns for cars, trucks, busses, boats and railway trains since 1912, our production is now devoted entirely to the War Effort. After Victory Buell Air Horns will again be available for old and new cars.

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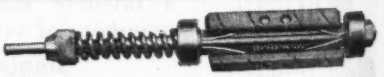

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Every mechanic should own one of these tools. The accumulation of muck and scale is quickly removed and the brake cylinder polished to a mirror finish in a few seconds.

YOUR MECHANICS can eliminate wasteful trips to have brake cylinders honed. Do this job in your own shop. The tool will service 80% of cars manufactured and sells for $3.25 from your jobber and is available on an AA5 priority rating or higher.

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Ask your Shurhit jobber or write us for details on General Ignition Assortments of fast-moving parts . . . Contact Points . . . Condensers . . . Rotors . . . Caps . . . Coils . . . Switches, etc.

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STAINLESS STICK LUBRICANT
DRIPLESS OIL
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RUBBER LUBRICANT
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GET HASCO'S QUOTATIONS FIRST for top quality, reconditioned used parts.

Armatures	Bolts
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Complete units suitable for rebuilding
We stock only genuine used parts. All are thoroughly tested and cleaned with the most modern methods and equipment. Each part carries our money-back guarantee.
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"Largest dismantlers and salvagers of Automotive Generators and Starters"

Where Secure Seals Are Vital
VICTOR
GASKETS, OIL SEALS
GREASE RETAINERS

Win Ordnance Flag

E. Edelmann and Co., Chicago, were awarded the Ordnance Branch flag by the War Dept. Feb. 19. The presentation was made at a dinner given to all the employees in the Edelmann factory and was awarded for "meritorious war production."

In making the presentation, Major D. S. Bradford, of the Chicago Ordnance District, congratulated the employees and management on their outstanding performance in delivering urgently needed war materials ahead of schedule.

Takes Car Factory Post

Raymond J. Hodgson, president of Graham-Paige Motors Corp., Detroit, has just announced the appointment of Edward D. Riordan as director of industrial relations for the company. Riordan comes to Graham-Paige from Bell Aircraft Corp., where he has been on the staff of the president, L. D. Bell.

Riordan has had many years of experience in personnel work and in production supervision. He served with Fisher Body for seven years, and one year with another General Motors division.

Appointed Sales Head

After 15 years in both sales and engineering for The Osborn Manufacturing Co.'s Foundry Machine Division, Leon F. Miller has been appointed sales manager, succeeding R. F. Lincoln, who has resigned to enter another field.

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have never swerved from their original standards of QUALITY AND SERVICE.
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Measures the recoil of springs up to 7" (free length) and 2½" in diameter when compressed to any predetermined length. Easy to "set," easy to operate, easy to read. No multiple dials. Simply read the dial of any accurate torque wrench at the moment the built-in-tone device sounds!

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Write for Bulletin ST-19

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AMERICAN HYDRAULICS
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GOSH! I WOULD HAVE RUN RIGHT OUT OF THIS AD IF IT HAD'NT BEEN FOR MY-
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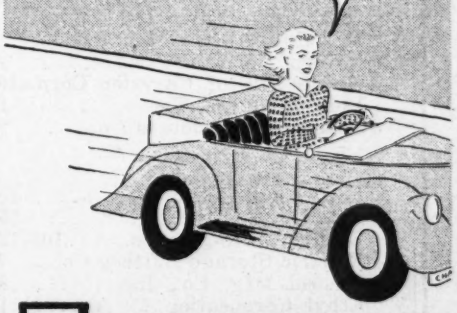
REG. U. S. PAT. OFF.
BRAKE-LINING



SOUTHERN
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